

Audubon

magazine

MARCH-APRIL 1952

50 CENTS A COPY



LAUREL REYNOLDS

Her preparation for her present career as wildlife photographer and nationwide lecturer was unintentional. Her reputation just grew along with the excellence of her originally avocational work. A Californian since her childhood, Laurel Reynolds now lives in Piedmont with her two children and physician-husband whose hobby has always been bird study. A contributor to the Audubon Magazine and for years editor of the Pacific Audubon magazine, The Gull, Mrs. Reynolds has also produced several well-known color motion pictures on scenery and wildlife in most of the United States.



"Well worth the difference"

I consider Bausch and Lomb binoculars ideal for observing birds in the field. In comparing them with less expensive glasses, I have concluded they are well worth the difference in price.

Laurel Reynolds

WRITE FOR FREE CATALOG. 577 pages of useful information you should know before you buy any binocular. Tells how to select a glass for your own use. Bausch & Lomb Optical Co., 577 Lomb Park, Rochester 2, N. Y.



Bausch & Lomb
Zephyr-Light
7x35 mm Binocular
Balcoted Optics
\$155, plus tax

When writing advertisers, please mention Audubon Magazine

Audubon magazine

Volume 54 Number 2
Formerly BIRD-LORE

PUBLISHED BY THE NATIONAL AUDUBON SOCIETY

*A bimonthly devoted to the protection and preservation of our native wildlife.
Fifty-fourth year of continuous publication*

CONTENTS FOR MARCH - APRIL 1952

LETTERS	71
THE KEY DEER: A CHALLENGE FROM THE PAST, Robert P. Allen	76
WILD BIRDS IN THE CITY, Varian Fry	82
SEEING BIRDS WITH A PENCIL, Margaret Loye	86
NATURE IN THE NEWS	90
A WILDLIFE REFUGE AT YOUR DOORSTEP, Marguerite Angelo Smelser	92
THE PRESIDENT REPORTS TO YOU, John H. Baker	98
PERILS OF THE FLYWAY, Robert S. Lemmon	100
YOUR WILDFLOWER GARDEN, Carol H. Woodward	101
HOME-BUILDER FOR WOOD DUCKS, Richard Stuart Phillips	104
MYTH-INFORMATION, Lewis Wayne Walker	109
SUGGESTIONS FOR A SMALL ORNITHOLOGICAL REFERENCE LIBRARY, Monica de la Salle	110
PHOTO QUIZ, Hugo H. Schroder	112
AMERICAN BITTERN—GENIUS OF THE BOG, Henry Marion Hall	114
OIL AND THE CALIFORNIA MURRE, Frances Houldson	118
AUDUBON GUIDE TO BIRD ATTRACTING, Edwin A. Mason	122
BOOK NOTES, Monica de la Salle	128
COVER: Photograph of young great horned owls by Rad Bascomb	

Kenneth D. Morrison, EDITOR; John K. Terres, MANAGING EDITOR; Andrew Bihun, Jr., ADVERTISING MANAGER; Frederick L. Hahn, EDITORIAL LAYOUT; CONTRIBUTING EDITORS: Arthur A. Allen, Henry Beston, Alan Devoe, George Dock, Jr.; Ludlow Griscom, Louis J. Halle, Jr., John Kieran, Robert Cushman Murphy, Haydn S. Pearson, Donald Culross Peattie, Roger Tory Peterson, Herbert Ravenel Sans, George Miksch Sutton, Edwin Way Teale.

AUDUBON MAGAZINE is published bimonthly by the

National Audubon Society. Subscription \$3.00 per year in U. S., its possessions and Canada; 2 yrs.—\$5.50; 3 yrs.—\$7.50; Foreign, 1 yr.—\$3.25. Checks and money orders should be made payable to AUDUBON MAGAZINE. Editorial and advertising office, 1000 Fifth Avenue, New York 28, N. Y. Reentered as second-class matter April 29, 1942 at the Post Office at New York, N. Y., under the Act of March 3, 1879. Copyright, 1952 by the National Audubon Society. Postmaster: If undeliverable, please notify Audubon Magazine on form 3578 at 1000 Fifth Avenue, N. Y. 28, N. Y.

INDEXED IN THE READER'S GUIDE TO PERIODICAL LITERATURE



NATIONAL AUDUBON SOCIETY

1000 FIFTH AVENUE

NEW YORK 25, N. Y.

COMING EVENTS AT AUDUBON HOUSE

April—"AN ARTIST LOOKS AT SHELLS"

Harriett Lord

Audubon House and the Library are open Monday through Friday from 9 to 5. Closed Saturdays, Sundays and Holidays.

Your Membership Supports This Work:

Audubon Junior Clubs, in which more than eight million children in schools and youth groups have been enrolled since 1910.

Audubon Camps, for training adults in nature and conservation, at Medomak, Maine; Greenwich, Connecticut; Norden, California.

Audubon Screen Tours, lectures and color motion pictures which reach an audience of 500,000 people a year in some 160 cities.

Audubon Wildlife Tours around Lake Okeechobee and into the Everglades National Park, under direction of trained naturalists.

Audubon Art Tours, loan exhibits of original art by famous bird painters.

Branches and Affiliates of your Society advance the Audubon cause in more than 200 communities.

Research Projects, especially for species threatened with extinction.

Photo and Film Department, from which wildlife photographs and slides can be purchased and educational films rented.

Service Department, through which advice as to nature books, prints, bird cards, binoculars, etc., may be obtained, and such items purchased.

Public Information Department services members, and furnishes the press and radio with information about nature and conservation.

Publications: *Audubon Magazine*, sent to all members; *Outdoors Illustrated* (\$2.00 a year), well adapted to school use and illustrated in color; *Audubon Field Notes* (\$2.00 a year), publishes results of bird watching, including seasonal reports and bird censuses; *Nature Program Guide*, *Junior Club News* and *Audubon Nature Bulletins* are for teachers and youth leaders.

Sanctuaries: The Society's wardens patrol upwards of 2,000,000 acres of land and water including Audubon Nature Center, Greenwich, Connecticut; Rainey Wildlife Sanctuary, Abbeville, Louisiana; Roosevelt Memorial Sanctuary, Oyster Bay, Long Island; San Gabriel River Sanctuary, Los Angeles, California; Todd Wildlife Sanctuary, Hog Island, Maine; and extensive areas in Texas and Florida.

Your Membership will advance public understanding of the value and need of conservation of soil, water, plants and wildlife and the relation of their intelligent treatment and wise use to human welfare.

Regular	\$ 5	Supporting	\$ 50
Sustaining	10	Contributing	100
Active	25	Life	200

Directors: F. Cecil Baker, Guy Emerson, Ludlow Griscom, Erard A. Matthiessen, Mrs. Duncan McDuffie, Wheeler McMillen, Matthias Plum, Mrs. Avery Rockefeller, Paul B. Sears, Grant G. Simmons, Gardner D. Stout, Gustav A. Swanson, Mrs. Carl Tucker, R. Gordon Wasson, Charles G. Woodbury.

Regional Offices: Tropical Florida, 311 E. Flagler St., Miami 32, C. M. Brookfield, representative; California, 693 Sutter St. (Room 201), San Francisco 2, Miss Mary Jefferds, manager.

Officers: Ludlow Griscom, *Chairman of the Board*; Gardner D. Stout, *Chairman, Executive Committee*; Robert C. Murphy, *Honorary President*; John H. Baker, *President*; Carl W. Buchheister, *Vice-President*; Erard A. Matthiessen, *Secretary*; R. Gordon Wasson, *Treasurer*; Irving Benjamin, *Asst. Treasurer*; Shirley Miller, *Asst. Secretary*.

Letters

Golf Courses As Sanctuaries

During the winter of 1951 the members of Minikahda Country Club in Minneapolis were asked to finance a birdhouse and bird-feeding project. Some members built or purchased their own birdhouses. Others contributed funds for this purpose.

Seventy houses in all were provided for purple martins, flickers, crested flycatchers, bluebirds, wood ducks, tree swallows and house wrens. The houses were erected in early spring largely on steel posts scattered over the golf course.

We had 47 occupancies the first year, including two houses occupied by crested flycatchers, 17 by house wrens, four by tree swallows and three by purple martins.

Each birdhouse has an aluminum plate showing the name of the donor. The project has created a tremendous interest among the members of the club. It occurred to some of us that as we develop and beautify a golf course, we destroy a large percentage of the natural nesting sites for birds. We thought that if we provided a sufficient number of nesting houses, we could restore the golf course as a natural sanctuary for the species of birds which formerly nested there.

The first year's success is very gratifying. Some relocations will be made this coming year and the number of houses will be expanded. It is hoped that the success of this project will encourage other golf courses throughout the country to follow a similar plan.

WHITNEY H. EASTMAN

Minneapolis, Minnesota

Broley Reports on Eagles

I have covered most of my territory and have only seven active bald eagle nests. Between Tampa and Englewood, Florida—some 80 miles—I have only two nests, and one of these is only 500 feet from a trailer camp and the birds are disturbed frequently. Between Tampa and Englewood there are some 40 vacant nests. Some of these are in quiet places where there is no disturbance but no birds have claimed them. What has happened to these eagles?

In 1950 I banded 25 eagles; last season I

When writing advertisers, please mention Audubon Magazine

"Sure to become to bird watchers what Duncan Hines is to gourmets."

—Audubon Magazine

A GUIDE TO Bird Finding EAST OF THE MISSISSIPPI by Olin Sewall Pettingill, Jr.

This book tells you how to locate any given species occurring regularly in 26 states: where and when to go, and how to get there. Special emphasis has been placed on important bird concentrations; the representative habitats of each locality are described in detail; national and state parks, forests and wildlife refuges are included, together with private sanctuaries, ornithological institutions and societies. With hints for the bird finder, reference material, an index by common names and 72 illustrations by George M. Sutton.

"A really different guide and one which ably fills a real need. The importance of this Baedeker to the birds will be realized at once by neophytes and by experienced bird students."

—Baltimore Sun

\$5.00 at all bookstores

OXFORD UNIVERSITY PRESS
114 Fifth Avenue, New York 11

Amazing 7 POWER 35 MM. BINOCULAR



Extremely accurate. Highly color-corrected. Advanced design. Coated. Needle sharp vision. High resolving power. N-C Magnesium body. Extremely Light. Only 17 ozs. Field: 375 ft. 4 1/4" x 5 1/4". (Central Focus \$4.00 extra.)

30 DAY FREE TRIAL! MONEY BACK GUARANTEE!

AT LEADING DEALERS or WRITE DIRECT.

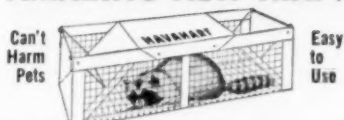
33 More BUSHNELL MODELS
From 2.5 x 25 mm to 16 x 50 mm - \$6.95 Up.

Ask About Special Lay-away Plan. NO CASH REQUIRED

FREE! Catalog and Guide How To Select Binoculars

BUSHNELL Binoculars Bushnell Bldg. Dept. J64
Rochester 1, N.Y.

AMAZING NEW TRAP:



Trap for fun, profit, or rodent riddance. *Guaranteed* HAVAHART trap catches them alive, protects pelts. No springs or jaws. Rustproof. Sizes for all needs. For free booklet, mail coupon today.

HAVAHART, 51-M Water St., Ossining, N. Y.

Please let me in on your trapping secrets.

Name

Address

GET READY



FOR SPRING

Send for these *timely*
guides to the out-of-doors

Audubon Nature Bulletins

10¢ EACH

THE PARADE OF SPRING WILD
FLOWERS

THE MYSTERIES OF BIRD
MIGRATION

FROGS AND TOADS

FRESH-WATER AQUARIUMS

ANIMAL TRACKS IN MUD, SAND
AND SNOW

Or . . . Send for

*Complete set of 60 AUDUBON
NATURE BULLETINS at the special
price of \$5.00 for the set.*

*A complete annotated list of all 60 of these
attractive, interesting, illustrated bulletins
will be sent on request.*

NATIONAL AUDUBON SOCIETY
1000 Fifth Avenue, New York 28, N. Y.

banded 25; but I will do well to get 18 or 20
this year.

CHARLES L. BROLEY

Tampa, Florida

Youngest Member Is Texan

We introduce herewith, to the Audubon membership throughout the United States, the youngest member of the National Audubon Society—John Wagner, Jr. of Kerrville, Texas. At the time his membership was sent to Audubon House, his age was 29 hours and 15 minutes. We feel perfectly safe in saying that a record has been set.

When the 1951 Audubon Camp of Texas came to a close with a brief staff meeting, a suggestion was made by Mrs. R. W. Kelting, wife of the plant instructor, that young Mr. Wagner, a very new son of a student in the concluding session, be unanimously advocated, recommended and installed as a member of the Society in good standing. Unanimity prevailed; his membership was submitted. We take great pride in announcing the smallest member from the largest state in the Union. May he live long and prosper!

ALEXANDER SPRUNT, JR.

Charleston, South Carolina

English Reader Wants Bird News

I have received a subscription to your magazine from my cousin in Kalamazoo who knows that I am interested in birds. I would like to say, as a foreigner, that I think it is excellent.

I wonder if one or two of your bird-watching readers would like to exchange letters with me—you know, exchange bird news and gossip.

E. C. DOUGHTY

53 Bath Street
Market Harborough
Leicestershire, England

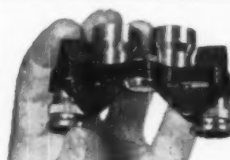
CORRECTION

Both Francis H. Allen of Cambridge, Massachusetts and Robert Cushman Murphy, American Museum of Natural History, New York City, have called our attention to the spelling of the name of the late Robert Searle Chafee which was misspelled "Chaffee," page 36 of the January-February 1952 issue of *Audubon Magazine*. Dr. Murphy, who was a cousin of Mr. Chafee's, assures us that the name is pronounced "Chay-fee."—The Editors.

Attention **BIRD LOVERS..**



Every UNITED binocular is sold with a Written Guarantee of Satisfaction and bears the UNITED "Seal of Quality". BUY-TRY for a full 30 days—if not completely delighted in every way return for an immediate unquestioned refund of your money.



6 POWER BINOCULAR
\$16.95
7 POWER \$19.95

These binoculars purchased many months ago at bargain prices were just delivered! While stocks last we will sell them at below selling prices! **COATED!** Assuring brighter, sharper images. Pocket size—weigh 4 oz. and 6 1/4 oz. respectively! Not a field glass but full power binoculars with a field of 375 feet at 1000 yards! Precision made prism binoculars made of lightweight, durable, all chrome metal. Achromatic lens.

6 TELESCOPES IN ONE!
15 TO 40 POWER! WEIGHS 18 OZ.



American (Wollensack) instant focusing at 15x, 20x, 30x, 40x. Turn power tube to click—no guess work. Measures 8 1/4" closed, 27" extended. Rust proof chrome tubes. Objective lens 40mm! All 12 optic surfaces **COATED!** See 22 bullet holes at 300 ft. also astronomical observations, \$30.75 price includes tax.

7 x 50 PRISM BINOCULARS
\$36.00

COATED. Powerful, precision made binoculars that provide a maximum of light transmission assuring brighter, sharper, clearer images. Scientifically ground Achromatic lens. Durable, lightweight metal construction. Moisture-Dust proofed! **MORE PROOF—"You Save at UNITED!"**



7 x 50 CENTER FOCUS \$39.50

COATED. Instant finger tip adjustment. Undistorted field of 375 feet at 1000 yards. Increase bird watching enjoyment a thousand-fold.

COATED!! FEATHERWEIGHT!!



6x30—\$27.95
8x30— 32.50
10x30— 39.50

Three (3) superb achromatic glasses to choose from. Weigh 15-18 oz. each! Measure 4 1/2" x 6". Top quality binoculars combining everything a bird lover wants in a binocular. Economy Priced.

COATED! FEATHERWEIGHT!

16 x 50 \$69.50

EASY TO HOLD EASY TO FOCUS

The ultimate in a fine binocular. Tremendous power. **Featherweight** (weighs only 25 ounces!). Precision made in every detail. **COATED** providing sharper, brighter images. Individual focus. Objective lens is 50mm (2 inches) across!



ADD FEDERAL EXCISE TAX TO ALL PRICES

AIR MAIL SERVICE

For same day shipment by **AIRMAIL**, add to above prices:

6 power pocket size \$1.00
6 power, 8 power or telescope 2.00
7, 10 and larger 3.00

All binoculars come with genuine leather carrying case and straps.



Cash orders shipped postpaid.
 C.O.D.'s require \$2.00 deposit.

UNITED BINOCULAR COMPANY

United Building, 9043 S. WESTERN AVE., Dept. ARF-1528, Chicago 20, Ill.
 Serving Outdoor Enthusiasts Since 1937

When writing advertisers, please mention Audubon Magazine

Get into the Picture

at an

AUDUBON CAMP

1952 Summer Season

These camps offer fascinating and highly practical two-week sessions for TEACHERS, other YOUTH LEADERS and for the interested LAYMAN. They are outdoor schools for ADULTS, who explore fields, woods, ponds, marshes, mountains and shores—learn about rocks, soil, water, weather, plants, animals and stars. Emphasis is on interrelationships between soil, water, plants and wildlife and on practices for conservation of these natural resources. Projects and activities for schools, clubs, camps are discussed and demonstrated. Minimum age 18 years. The fee includes board, lodging, tuition and transportation on regularly scheduled field trips.

Audubon Camp of Maine — In the Todd Wildlife Sanctuary on a beautiful spruce covered island of 330 acres, on the coast of Maine. The camp is one-half mile from the mainland, near Damariscotta, and 60 miles N.E. of Portland. Fee is \$90 for each two-week session.

June 13 - June 26

July 11 - July 24

June 27 - July 10

Aug. 1 - Aug. 14

Aug. 15 - Aug. 28

Audubon Camp of Connecticut — In the southwest corner of Connecticut, at the Audubon Center—408 acres of richly varied forests, meadows, ponds and streams, including a 125-acre wildflower garden unit. Near Greenwich and 35 miles N.E. of New York City. Fee is \$80 for 13-day sessions; \$40 for 6-day sessions.

June 16 - June 28

July 14 - July 19

June 30 - July 12

July 28 - Aug. 9

Aug. 18 - Aug. 30

Audubon Camp of California — In spectacular Sugar Bowl Valley near historic Donner Pass, at 7000 feet elevation in the High Sierra. One mile from Norden on the highway from Sacramento to Reno, and 24 miles from Lake Tahoe. Fee is \$90 for each two-week session.

June 15 - June 28

July 13 - July 26

June 29 - July 12

July 27 - Aug. 9

Aug. 10 - Aug. 23

For Further Information, Write to
NATIONAL AUDUBON SOCIETY, 1000 Fifth Ave., New York 28, N. Y.



A Naturalist's
Adventure in Nepal

Search for the Spiny Babbler

by Dillon Ripley

Dillon Ripley traveled eight thousand miles to the capital in the hidden valley of the "Jewel in the Lotus" on an amazing expedition, the adventure of which enlivens every page of this book. It is fascinating reading for anyone interested in birds, natural history in general, or in exploring the far corners of the earth. Dillon Ripley is a well-known ornithologist, author of the *The Trail of the Money Bird*. \$4.00

Wildlife in Color

by Roger Tory Peterson



"Mr. Peterson has done it again! Through Mr. Peterson's latest book, one can readily see why he is rated as one of the top all-round naturalists. This book contains 453 full color illustrations of wildlife and will be a welcomed addition to the library of anyone who enjoys the out-of-doors." *Camping Magazine*

"A magnificent gallery of full-color wildlife miniatures, painted by outstanding artists of the field and stream . . . a gem of a book." *Christian Science Monitor*

Sponsored by the National
Wildlife Federation \$3.00



Houghton Mifflin Co.

Fill out this coupon and mail to your nearest bookstore or to the National Audubon Society, 1000 Fifth Ave., New York 28, N. Y.

Please send me.....copies of SEARCH FOR THE SPINY BABBLER at \$4.00 each and.....copies of WILDLIFE IN COLOR at \$3.00 each.

☐ check enclosed ☐ charge
☐ send C.O.D.

Name
Address
CityZone
State

add any city or state sales tax

When writing advertisers, please mention Audubon Magazine



THE *Key*



The Florida keys, watery world of the key deer.



The Alaskan moose, largest of the deer family, towers over the tiny key deer (right) and the even smaller Chilean pudu.

Drawings by the author.

Size of northern white-tailed deer (left) compared with male and female key deer and a Gordon setter dog.



ALASKAN MOOSE

CHILEAN PUDU

KEY DEER



threatened and the distress flags are flying. The response is such that it cannot be ignored.

In the Florida Keys, Jack Watson of the Fish and Wildlife Service has not only been doing a superlative job of enforcement and fire prevention, but has assembled impressive data on the habits of the key deer. John Dickson, biologist for the Florida Commission, has made outstanding progress with his studies of the plants and has likewise learned a great deal about the deer. These two men have brought together more information on the subject than has been available at any time since the tiny animal was described as *Odocoileus virginianus clavium*, a distinct race, differing in several essentials from the larger white-tailed deer occurring on the mainland of Florida.

Perhaps the most unique thing about the key deer is its toy size. The deer of the world range from the giant Alaskan moose, with a shoulder height of more than seven-and-one-half feet and a weight of 1,700 or 1,800 pounds, to the tiny Chilean pudu which stands only 12 or 13 inches high. The average key deer buck is twice the size of a pudu, but it is still one of the very few deer with a shoulder height under 30 inches. There are several varieties of rea-

sonably large dogs like the setters, that stand higher and outweigh the average key deer.

Of several of these deer that were killed by automobiles along U. S. Highway 1, which crosses Big Pine Key, the bucks averaged 25 inches at the shoulder, 38 inches total length and 33 pounds in weight. Does averaged 20 inches at the shoulder, 34 inches total length and 30 pounds in weight. Only some half dozen kinds of deer in all the world are smaller, the Chilean pudu, the brown brocket of tropical America, the musk deer of the Himalayas, the tufted deer of China and Tibet, the Chinese water deer and the Indian muntjac. Although the strange little musk deer has been greatly depleted for its musk, which is used in perfumes, the key deer is the rarest of all these miniature creatures.

The pigmy size of the key deer accounts for its separate identity and is the result of its peculiar environment. When its ancestors first migrated to the Lower Florida Keys, presumably from the mainland and possibly several thousands of years ago, they were probably identical with other white-tailed deer of the Florida peninsula. But countless centuries of time and the slow, steady influence of the environment

The key deer spend most of their time on a group of nine keys, about 110 airline miles southwest of Miami. Photograph by Dr. Herbert Mills.



in which it finally became isolated,* gradually molded it to its present elfin form. It is perfectly adapted to a normal existence in the environment of the keys, if protected from speeding cars, hunters and fires. But it would almost surely lose its identity by interbreeding with the larger white-tailed deer if transported elsewhere, as has been proposed.

Jack Watson has estimated that the entire population of these rare animals, as of January 1, 1952, totaled 57 individuals, including the surviving 1951 crop of fawns, of which Watson believes there were no less than 12. Losses due to hunting have been virtually eliminated as a result of Watson's tireless patrols and excellent public relations work.

It is felt that the downward trend of the population has been arrested and, if present protection can be made permanent, the herd should approach carrying capacity of the range within a very few years. It is not yet known what this figure may be, but there certainly will be enough of these dainty animals to permit the public to enjoy frequent views of them, a pleasure that

is now denied us because of the small numbers of the deer, their scattered distribution and the nature of their habitat. It is my firm conviction that, in time, groups within the herd will constitute a major tourist attraction, thus winning the wholehearted support even of those who look on the key deer today as of no value.

The distribution of the key deer is now limited to some 18 keys, half of them of major importance to the animals; the other half used infrequently by them. The nine major keys are shown on the accompanying map and it will be seen that the heaviest use is made of Big Pine Key and Big Torch Key. The key deer make moderate use of the remainder of Big Pine and of Little Pine, they use lightly portions of Big Torch, Middle Torch, Cudjoe, Knockemdown, Howe, Annette and No Name. Their use of other keys, considered to lie within their range, is infrequent, some of the outlying areas like the Johnson Keys and the Water Keys having been occupied by them only to escape the dog packs with which the little deer were formerly hunted. As the herd increases it will be essential to have all of the outlying places available. A good many of them have habitats suitable for the support of a number of deer.

All of the deer tribe are strong and willing swimmers and these little fellows are no exception. It seems possible that the key deer is more inclined to put out to sea than most members of the family. Even without the pressure of a pack of baying hounds at their heels, they take to the water and swim from one key to another. Watson showed me at least a dozen different water crossings that he is aware of, some of them covering as much as one mile of open water.

Studies by Watson and Dickson suggest that the key deer have established summer yards on Big Torch and Big Pine and to a lesser extent on Howe, Annette and No Name Keys. These yards, where the fawns are cared for by their mothers until fall or early winter, are chiefly hammocks of tropical buttonwoods, with varying amounts of hardwoods and other hammock species—

* See discussion of this in an article by the author, "Can We Save the Key Deer?" *Natural History Magazine*, February, 1951.

Isolation has preserved the elfin size of the key deer.



gumbo-limbo, Jamaica dogwood, tamarind, strangler fig and others. An important limiting factor of the key deer is the necessary presence of water holes that remain available to them throughout the summer, which normally is the rainy season. A surprising number of water sources have been discovered, water that is fresh enough to support a well established population of frogs, alligators and plants such as cattails that require a water habitat that is fresh or nearly so. Watson has been making salinity tests at eight water holes on Big Pine Key and keeping a valuable record of seasonal variations of both saline content and availability.

Although many water holes go dry in winter, when there is little or no rainfall, there is no critical water shortage at present, although the increased winter deer population on Big Pine Key may be, in part, a result of the undependability of water sources on certain outlying keys. Even on Big Pine we saw many dried-up holes on January 5, but there were, on that same date, abundant sources near-by, particularly in the Watson Hammock region, an extremely valuable deer habitat that should by all means be included within any refuge that is established.

The rutting or mating season apparently begins about the middle of December and continues through the month of January. This is a little later than with other races of the white-tailed deer. Fawns are born in June or July, again a trifle later than in other parts of the white-tail's over-all range. In September the bucks begin rubbing the velvet from their tiny three-pronged horns. Watson showed me a number of slender tree trunks and low branches that had been skinned or broken by this necessary activity. I was impressed by the nearness of these bruised places to the ground, the average height being no more than about 24 inches. Next to the sight of the little bucks themselves, I felt that nothing I had seen so convincingly demonstrated their diminutive size.

Key deer are paler and have smaller teeth than the relatively big white-tails of the mainland of Florida. By comparison, their antlers are stunted and do not show

as many points. Another apparent difference is the fact that the color of their coats does not change from summer to winter, a characteristic of all other white-tailed deer. They retain the light, glossy red-brown coat throughout the year. Nor does there seem to be any noticeable change in the length or thickness of their pelage.

Watson and Dickson find that the deer remain in the shelter of buttonwood hammocks, near a supply of drinking water, during daylight. At dusk they move to browsing places, apparently feeding more or less through the night, returning to shelter when the sun has dried the dew in the early morning. Old hunters told Watson that they generally ran their dogs in the daytime, not only because they could then see to shoot accurately, but because at night they feared the big rattlesnakes of the larger keys which, like all pit vipers, hunt after dark.

Food is of primary importance to the deer. After talking with John Dickson, it is apparent that palatable food is abundant and available throughout the year. By examining deer pellets and the stomach contents of animals killed on the highway, Dickson had at that time determined that 18 different kinds of plants provide food for the key deer. There is some variation in the availability of these food plants owing to fruiting periods, but plants are so abundant and bloom in such rapid succession that some outstanding fruit or seed is always on hand.

At present it is believed that the most important food of the key deer is the fruit of the silver palm, *Coccothrinax argentea*, the berries of which, as Catesby wrote, "are large and sweet, and yield a good spirit." These palms grow abundantly on all keys in the area except Ramrod. The key thatch palm, *Thrinax microcarpa*, which fruits a little later than the silver palm, is almost equally important as a food and is found on all keys in the range of the deer. By the time one has lost its fruit it is soon blooming again and the supply of the large, sweet berries is well-nigh inexhaustible.

Also valuable as food are the fruits or seeds of the hog plum, *Ximenia americana*,

the sweet acacia, *Vachellia peninsularis*, ground cherry, *Physalis angustifolia*, wild dilly, *Mimusops emarginata*, Joe wood, *Jacquinnia keyensis*, limburger plant, *Morinda roice*, seven year apple, *Casasia clusiifolia*, and the leaves of the wild lettuce, *Lactuca intybaseus*, tropical buttonwood, all three mangroves and a number of others. Dickson has studied the distribution of these food plants and their relative abundance on a dozen keys within the range of the deer. During the remainder of his stay there, which runs through July 1952, this highly useful data will be corrected and extended.

From the foregoing, we may expect slowly increasing numbers of these attractive little deer, well adapted to an environment that appears to provide them with an abundance of the necessities of their harmless and unique existence. On the other hand we have the grim knowledge that the security of a permanent refuge has not, at this writing, been provided, that the danger of destructive fires set by men is ever present, and that people who would cheer-

fully slaughter the last of these helpless animals in the name of "sport" must still be restrained forcibly by a capable warden. Automobiles on highways of the keys, where all recent losses have taken place, are a constant threat to the key deer. Warning signs have been erected and drivers cautioned through newspaper articles and by personal contact, but until the wanderings of the deer can be limited by means of a high fence, these losses will offset gains made by preventing fires and poaching.

Meanwhile, those who are seeking to improve conditions for the key deer should have the continued support and constant encouragement of all who believe that this little animal is worth saving. The key deer is a living example of the pristine land that we, with such good fortune, inherited. The key deer's survival can be a constant reminder of our common debt to this continent and to our once endless bounty. Its preservation will be a credit to the present; an eloquent salute to the past.

We must not fail to meet this challenge.

Jack Watson with a young key deer doe killed on the highway. Photograph courtesy U.S. Fish and Wildlife Service.



Wild Birds *IN THE* CITY

By Varian Fry

ASK the average city dweller what birds can be seen in his city, and ten to one he'll answer, "None but pigeons and sparrows." If he lives east of the Rockies he may add starlings; west of the Great Plains he may include linnets. Actually, many of our big cities can boast a surprising number and variety of wild birds, transient and resident, ranging all the way from eagles to hummingbirds.

The duck hawk, an amazing bird of prey—the fastest flyer in North America—usually nests on lonely mountain crags; but recently it has developed a liking for the man-made canyons of skyscrapers. Why? Probably because its natural habitat offers no such inexhaustible source of juicy meat as do the flocks of city pigeons.

The duck hawk is the American race of the peregrine falcon, a bird which has been used in hunting for 4,000 years. This noble bird, which swoops on its prey like a thunderbolt (its dives have been clocked at 175 miles per hour), can today be seen in some of our cities during the spring and summer months. A pair recently set up housekeeping on an office building at Fifth Avenue and 57th Street, New York City. In 1944 another pair nested a few blocks away on the Hotel St. Regis. A movie actress, who stepped out on the hotel balcony where the hawks had made their home, was quickly driven indoors by the pair. Duck-hawk parents are as fearless in the defense of their downy and beady-eyed young as they are in pursuit of their winged prey. One of these hawks was found nesting in Chicago's Loop a few years ago. In Montreal a pair of duck hawks has made its home on a ledge of the Sun Life Building since 1938. The insurance company set up a platform for the birds to keep their eggs from rolling off.

In Denver another variety of falcon, the Richardson's merlin, can sometimes be seen

at dusk, cruising along the cornices of the downtown buildings, ready to pounce on some unsuspecting linnet that has already gone to bed.

The red-shouldered hawk—less swift and fierce than the falcon—is a bird of woods and fields; but not long ago one of these handsome creatures spent a couple of months feeding on the starlings which roost on the Metropolitan Museum of Art and American Museum of Natural History in New York City. A friend of mine who was walking on Fifth Avenue saw it flying slowly, and low, over the stream of traffic.

From time to time owls have made their appearance in the hearts of our big cities. In Minneapolis a great horned owl—one of the largest and fiercest birds of its kind on the North American continent (it has rarely been tamed)—once flew through an open window of the B. F. Goodrich Company's offices there. Captured, the bird was presented to the Minneapolis Science Museum, but it died. When the Museum's taxidermist prepared it for mounting he found that the owl had eaten a porcupine—a fatal meal. Its last flight must have been a long one, for porcupines do not live within 25 miles of downtown Minneapolis.

A barn owl, victim of a broken leg, was captured in Stuyvesant Town, a huge housing development in lower New York City. A long-eared owl startled a window washer on the 67th floor of the Radio Corporation of America building by flying into the room when he opened a window.

At rare intervals birds from great distances have shown up in cities. I have read, for instance, that a scaled quail, a native game bird of our Southwest, was taken from the Hudson River at West 80th Street, New York City, by boys in a canoe; a Ruppell's



The peregrine falcon, or duck hawk, has nested on tall buildings in five large cities of the eastern United States. Photograph by G. Harper Hall.

vulture, a huge bird from North Africa, mysteriously appeared in a Manhattan backyard; and a white-breasted cormorant, a diving bird from Peru, once landed in the city from the hold of a newly arrived ship.

The most spectacular visitor of all I myself once saw from atop the RCA building in New York. I was peering into a light winter fog when suddenly, drifting majestically on the air current, as if he were gliding over the highest peaks of the Adirondacks, appeared a bald eagle!

One autumn day a hermit thrush flew into a flower shop on New York's Madison Avenue. Finding the warm, moist air and flowers to its liking, it elected to spend the winter and soon became so tame that it would alight on anyone's hand to get a meal worm. In the spring the bird grew restless, and one fine day it darted through the transom and flew away. It did not return that autumn, but when the next fall migration came around it was back to spend another winter with its florist friends.

A doctor in midtown Manhattan was the startled host not long ago to a Philadelphia vireo with broken tail feathers. His un-

expected patient stayed contentedly in a cage until new tail feathers had grown and it was ready to be discharged as cured. Toward the end of World War II a tired, migrating goldfinch entered an open window of an office on the 58th floor of a Manhattan skyscraper. Three hours later another followed. Chickadees and exhausted hummingbirds have been seen in the city's streets. A lawyer in a downtown skyscraper has had among his callers a scarlet tanager and a black-poll warbler.

In the entire New York region, including the outlying suburbs, the best single spot to see wild birds is a section of Central Park known as the Ramble. Central Park has played host to more than 200 different kinds of birds, from the diminutive hummingbird to the great blue heron. But a plain, ordinary backyard may do almost as well as a large park. A man who lives in lower midtown reports that the number of species spotted from his back window is close to 100. In the Bronx, patient observers have counted more than 100 kinds of birds on a single winter's day. In the financial district of Manhattan, four busi-

nessmen who look for birds before the Stock Exchange opens in the morning have compiled a list of 62 species. These Wall Streeters have seen northern yellow-throats, scarlet tanagers, an olive-backed and a gray-cheeked thrush, winter wrens, a brown creeper, and even that most elusive of game birds, the woodcock.

The brown creeper is an inconspicuous little bird which dwells in the woods and seeks out grubs in the cracks of tree bark. Yet last spring a surprised tenant of the RCA building in New York telephoned the National Audubon Society to report that there was a brown creeper working its way up the side of the building, behaving exactly as though that huge stone pile were a big tree.

In Cleveland, and many other cities, nighthawks — not really hawks but first cousins of the mournful-sounding whip-poor-will — nest on the roofs of buildings, and in the Public Square the song sparrow has been observed feeding with the pigeons. In or near the grounds of the city's Museum of Natural History 131 different kinds of birds have been recorded.

Chicago's Lincoln Park is an excellent place to see birds. Although it is in the middle of the city, 259 separate species have been seen there, 29 of them nesting and bringing up their young. The small public squares of the city teem with wild birds during the migration season. In good

weather you may see all five of the thrushes — hermit, wood, gray-cheeked, olive-backed and veery — and palm warblers, ruby-crowned and golden-crowned kinglets, brown creepers and various woodpeckers.

In Denver, as in many other western cities, linnets nest on downtown office buildings and sometimes in the city's traffic signals. Denverites are so accustomed to them that they pay little attention to these handsome red-breasted birds and their enchanting warble.

For several years a desert sparrow hawk has nested on the ornamental cornices of the Great Western Sugar Company building in Denver; barn owls have been reported in the warehouses of the lower business district, and the killdeer and spotted sandpiper have been encountered near the old City Hall.

In Boston the place to see birds is the Public Garden, where 140 species have been recorded, and 53 different kinds of birds have been seen in a single day. I know a man in Boston who has seen or heard 90 species from his own property in the 15 years he has lived in that city. Among them are a northern shrike, mockingbird, and bob-white, a bird which is usually seen only in farming country.

For years Oakland, California, a city of about 300,000, has played host to waterfowl because of Lake Merritt, a natural salt-water lake in the heart of town. Some 75

The eastern nighthawk nests on the rooftops of buildings in many cities. Photograph by Harry Craft.



different species of waterfowl have been observed there, including three kinds of loons, six kinds of geese, nine kinds of gulls and 23 kinds of ducks. Twice a day in winter the ducks are fed. It was necessary to fence off the feeding grounds to protect the ducks from the throngs of human visitors.

San Francisco also has its wild waterfowl visitors in Golden Gate Park. Los Angeles can claim a population of Chinese spotted doves, handsome natives of the Far East. Nobody knows how they got there.

What city cannot tell tales of its winged inhabitants and visitors? Birds have a surprising way of appearing in places where, by all the rules, they shouldn't be at all—birds of the far North and birds of the deep South; birds of the watery vastnesses of the oceans and birds of the remote mountain lakes; birds of the deep forests and birds of the driest deserts; birds of the arctic tundra and birds of the Caribbean Sea; even birds of Europe, Asia and Central and South America.

Are city people interested in birds? You bet they are. A few years ago a female mallard built a nest on the rotting piles near Milwaukee's heavily traveled Wisconsin Avenue bridge, and laid an egg. Thousands came to watch "Gertie," as she was named. Streetcar conductors stopped to look before rumbling across the bridge. Radio stations broadcast news bulletins on the developments. The *Milwaukee Journal* printed

daily articles, and Gertie's story spread from coast to coast. Unperturbed by all the excitement, Gertie laid eight more eggs. On May 30, when the first one hatched, she almost broke up the city's Memorial Day parade. By the time she and her ducklings were ready to be moved to safer quarters in a local park, Gertie had become the mallard that made Milwaukee famous.

If such a great industrial city can become that enthusiastic about a mallard, what wouldn't the rest of us city dwellers feel about our birds if we only knew they were there?

The trouble with us is we never look. For years I took it for granted that city birds weren't worth bothering about. Then one day I began to look. Starlings had been just about the extent of my experience. I knew there must be more city birds, and when spring came around I decided to find out. I have been looking ever since, for what I discovered astonished and delighted me.

Why not find out for yourself? If you are forced to live and work in a city or town and find its hard geometry grating on your nerves, and feel restless and hemmed in, try keeping your eyes open for birds. It is a hobby that costs nothing and proves immensely rewarding.

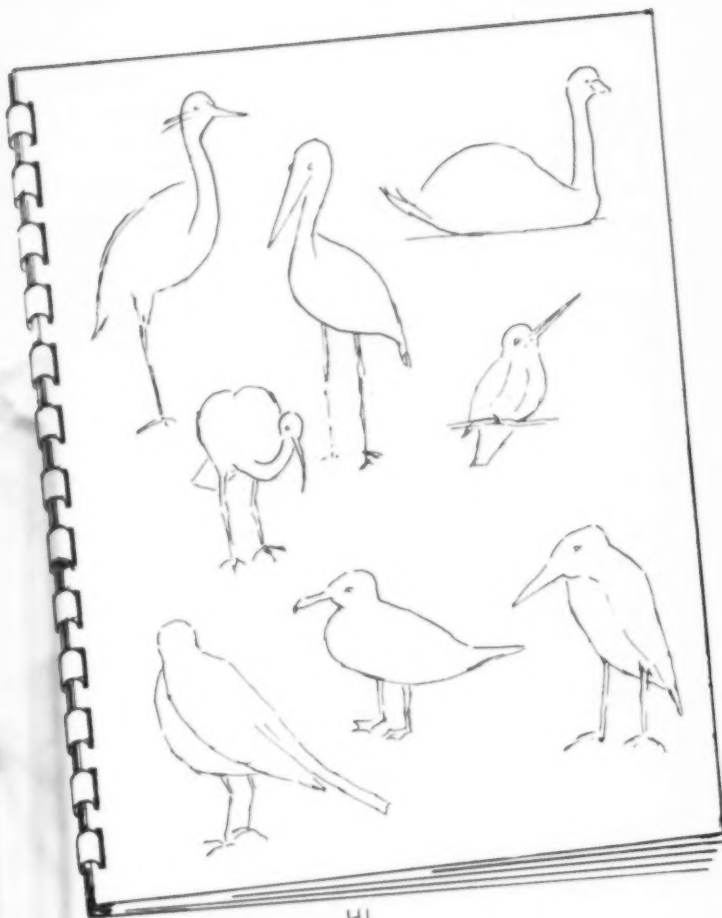
You can do it any time, anywhere. A city park, a backyard, an office or factory window—any spot from which you can see the air, the sky, the earth, the street, will do.

A parula warbler that flew into a New York City office building accepts termites from a kindly hostess. Photograph by John K. Terres.



Seeing

Here is an unusual
way to watch birds
that offers an en-
grossing new hobby.



↑ It takes a very few lines to
show that these eight birds
are each a distinct species.

All drawings by the author.

→ In these sketches the emphasis
is on action rather than detail.



Birds with a PENCIL

By Margaret Loye

SOMETHING was wrong. Birding was not the fun it used to be. To hear a wood thrush sing, track it down, find it, and stand watching it was pleasant, diverting and healthful—but aimless. Even though, some argue, a hobby is not supposed to have an aim, mine needed one. Chasing one bird after another just to name it had long lost its appeal. Censuses, in spite of their value, left me cold. I hated arguments over a bird being this species or that. I couldn't spunk up much enthusiasm over nests. Turning bird walks into scientific expeditions seemed too much like work.

This was my attitude in spite of the unusual fascination birds had for me. I loved their colors, songs and graceful lines. Learning to identify them by both appearance and song came fairly easy to me. Watching a robin on the lawn for minutes at a time was no task. Besides, the bird books I had bought for their beautiful pictures had become enjoyable reading. I had made a good start on a hobby apparently set for life. However, it seemed as if I were going around in circles in the middle of a road that should be leading me somewhere.

Then I began seeing birds with a pencil. After a session at the Audubon Camp in Maine, which in itself had made me take up my binoculars with new enthusiasm, I bought a delightful book of photographs of birds, "Wings in the Wilderness,"* by Allan D. Cruickshank, one of the camp instructors in birdlife. In the preface to this book, Mr. Cruickshank stated that he had set for himself the task of photographing as many as he possibly could of the approximately 700 species of birds on the North American continent north of Mexico. Here was indeed birding with a purpose! Something clicked in my mind. True, I was no pho-

tographer, and, much as I enjoyed seeing the work of photographers, I had neither the desire nor the money to become one myself. However, I could draw—not like Leonardo da Vinci, but well enough to have a great deal of fun. Why not draw birds?

It would seem that I was setting for myself a very difficult task, because most songbirds stay in one position about an instant, hardly long enough to "copy." However, good drawing, I reminded myself, is not copying. While working, I should be looking more at my drawing than my model. A bird should, therefore, be quite welcome to keep changing its pose so far as I was concerned! Could I not train myself to retain a mental picture of the bird in the pose desired against which to check my drawing? The process of this training, I had to admit, would be tough, but still it appeared feasible. Knowing at least something about bird anatomy, and the details of beak, tail, etc., of the more common birds, I should be able to fill in with this knowledge some of the gaps in my mental image of the bird I was trying to draw. So, in short, my dream seemed possible. Its difficulty offered a welcome challenge—something indeed to keep birding from becoming dull!

In spite of the difficulty involved, sketching, it appeared, would have some advantages over photography. Instead of a camera, tripod, film and many expensive gadgets to buy, and also to lug around, I would have only a pad, pencil and eraser, and later, perhaps, water color supplies. The sunlight need not be bright or from a certain direction. Also, with binoculars, I could probably stay farther away from the bird than a photographer could. If a blade of grass, a leaf, or a twig would ruin the composition of a picture or hide part of the bird for a photographer, it would not need to for me. I would simply leave it out! Again, I would not have to wait for just

* Oxford University Press, New York, 1947.

the second that a bird assumed the right pose. Knowledge and memory could help my pencil.

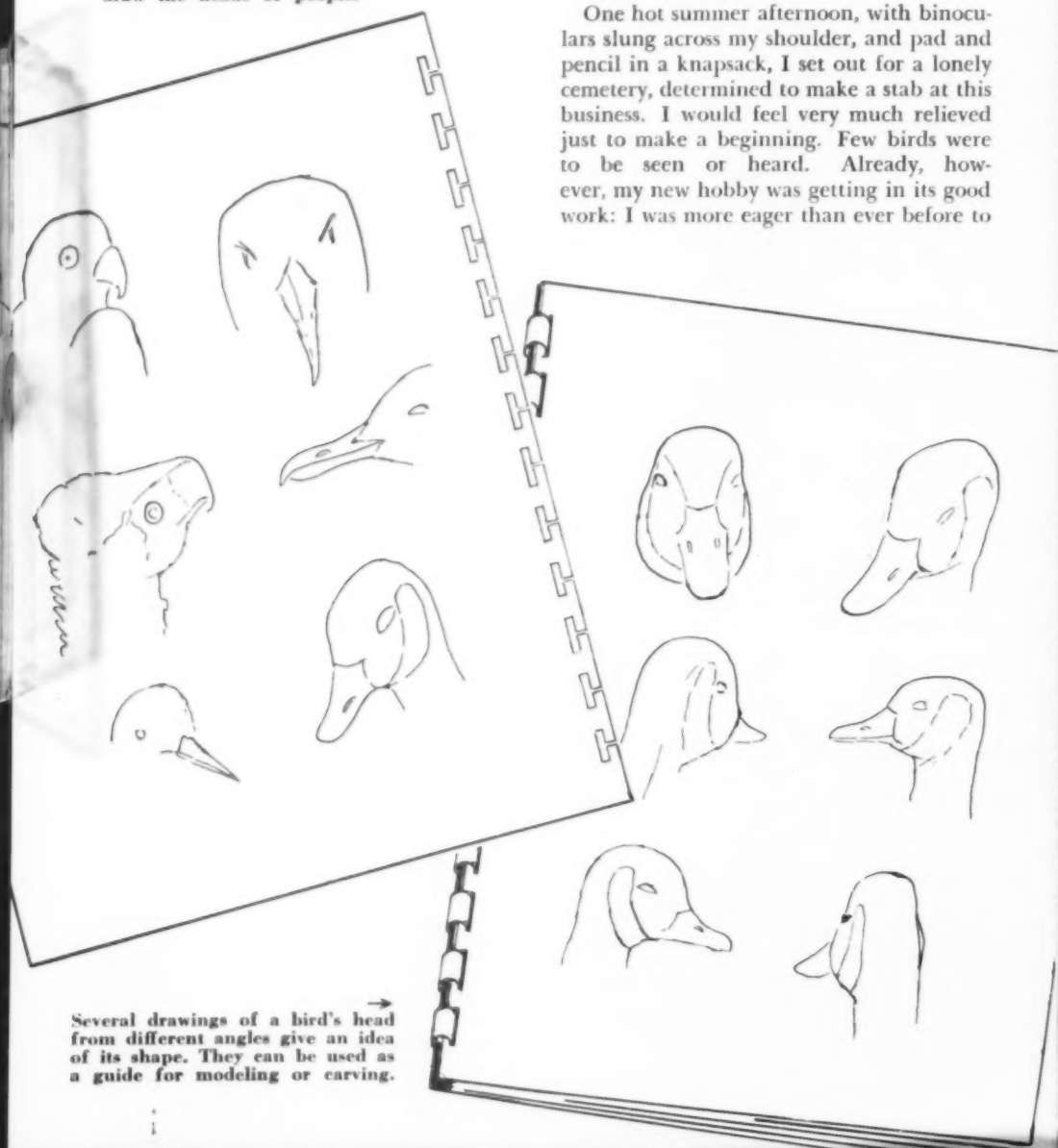
Two books on drawing and painting birds as much as said, "You're on the right track. Go ahead!" They contained line

It is much easier to draw the heads of birds than to draw the heads of people.

drawings and paintings showing that it was possible for even the beginner, and gave helpful suggestions.

In high spirits, I bought some small sketch pads with spiral binding, easy to carry and hold. A mechanical pencil I already had would be good, I thought, because the lead could be retracted and would not break while being carried or need sharpening after use.

One hot summer afternoon, with binoculars slung across my shoulder, and pad and pencil in a knapsack, I set out for a lonely cemetery, determined to make a stab at this business. I would feel very much relieved just to make a beginning. Few birds were to be seen or heard. Already, however, my new hobby was getting in its good work: I was more eager than ever before to



Several drawings of a bird's head from different angles give an idea of its shape. They can be used as a guide for modeling or carving.

see the few birds there were. Hearing a loud chipping, I stood still until a cardinal in a bush came into view. Although it was moving too fast for me to draw it, I did notice every turn of its head. Farther along the cemetery road was a subject made to order—a crow perched on top of a tree. I looked at it through my binoculars, then fished out my pad and pencil. My heart was beating fast. My hand almost trembled as I jotted down a few lines to represent the silhouette of the bird. I made the head too big and the neck too short. When I looked up at my model, alas, it had turned its head to the other side! But I must do the best I could. The beak was stouter than I had drawn it, and I corrected it. Then the bird flew away, leaving me with a few lines that did not say very much. Nevertheless, I had at least begun, and couldn't help smiling with satisfaction. Later on, I made two drawings, not much better, of a robin.

Several days later, following advice in one of the books on drawing birds, I went to the zoo. On previous visits, a few minutes in front of an exhibit of various kinds of cranes had been quite enough. This time, however, my pad and pencil induced me to spend almost an hour just in that one spot. How graceful the necks of these birds were as they stooped to feed! Occasionally, too, a bird would stride as if it were not to be trifled with. These birds, which I used to pass up as dull creatures, now appeared graceful, majestic and beautiful. Starting in the upper lefthand corner, I made quick sketches all over the page. I succeeded in catching a few poses, so that looking at my drawings later, I could actually tell what they were!

On another visit to the zoo, I concentrated on ducks. Another time, I found good subjects in the birdhouse. An exhibit of shorebirds was especially good. While I made it a rule not to "copy" a bird, but to study it and then give my full attention to my drawing, yet it was an advantage to have a bird stand still long enough to check my drawing, such as a willet that practically posed as it stood on one leg. Now my drawings looked more solid, three dimensional. While the results

were no miracle, considering the relatively long time the bird would hold to one position, still I was pleased to have them look like birds. Even so, I was keeping to line drawings, using no shading or color.

On several zoo visits I tackled an exhibit of flamingos, storks, ibises, herons, gulls, etc. On the gull, I noticed the line formed by the meeting of the bill with the face, and found it quite different from that on a duck. I made a separate sketch to show this. The bend in the neck of the flamingo as it would stoop to feed was hard to catch, and fascinated me. I made a separate sketch of that. The adjutant storks, which had rather bored me before, so amused me that I had to make sketches of two of them. Canada geese, being large, also made good subjects. I did several studies of their heads.

One morning I went again to the cemetery, where I was delighted to see sparrows and robins. The rather stately, quiet robins made excellent models. The sparrows were always on the move, but were so appealing as they would rest a moment on a tombstone that I had to try them.

From my back porch one day, I tried my hand at a few of the many cowbirds and starlings feeding on a neighbor's lawn—most of them in rear elevation. How sorry I was not to be able to represent that waddling gait of both kinds of birds!

At the time of writing this article, I have made only 44 small pages of very quick sketches. This brief experience, however, has already added a lot of zest to my birding. In itself, it has also been a lot of fun. Best of all, it gives me much to look forward to.

Just improving my technique of drawing birds should keep me busy for a long time. Jotting down a few lines, as I have been doing, mainly indicating attitude and pose, has been rather simple. Making refined drawings showing the details of the toes and texture of the feathers and the skin on the legs, and the expression in the eyes, will be something else. That is only to mention drawings in black and white. Using color will call for much additional skill.

Even if I do master the art of drawing and painting birds, it should be a long

time before I can lay down my pencil or brush and hunt for another hobby. One project that occurs to me is a study of the heads of different kinds of birds—a series of portraits. A book of photographs of the heads of various animals, including some birds, that was published several years ago* was not only entertaining, but very enlightening. Why couldn't a book on bird faces bring to light the many types of these that are seldom thought about? Compare the head of a thrush with that of a hawk! Even if such a book never got to the press, doing it would be a lot of fun.

With bird study growing more and more popular, should there not also be room for more pictures of birds for art's sake? There are already many pictures of birds to suit the scientist and the person who wants to identify birds. Such pictures are often jammed together, as many as will go on a page. Often they look stiff and lifeless. From the viewpoint of identifying birds and studying their structure and color, such pictures are certainly valuable. But how about pictures for those who love birds for the beauty of their shape, color and action?

Anyone handy with a pencil might get busy on birds. One need not be a Leonardo da Vinci to enjoy drawing them. The very act of making drawings that later look like junk quickens observation of birds enough to pay for the effort.

In making field notes on a bird one cannot identify, drawings would not need to be excellent or artistic to help with reference work back in the library or when consulting a friend. Just a diagram showing the shape of the bill and other important features, and the location, size and shape of important markings, would be a big help. The proportion and shape of head, wings and tail jotted down simply should help identify a bird in flight. A more ambitious bird artist could even try keeping a picture record of a field trip, sketching at least one example of each species seen.

A picture is worth—how many words?

* "Animal Faces," by R. Marlin Perkins, Foster & Stewart, Buffalo, New York, 1944.

Hats off to

THE relationship of predator to prey, or vice versa, is fundamental in the ecology of all living things. It is one of the most prevalent of all biological phenomena. Yet it is terribly misunderstood by many people, particularly by some sportsmen and nature lovers.

The trouble comes from competition among the members of the top link of the food chain for desired animals of the next lower link. In the pond food chain the rivalry (one-sided to be sure) is between man as a fisherman and

★ N A T U R E

PROTECTION PROVIDED IN BAHAMAS TO SAVE FLAMINGO COLONIES

*Reprinted from The New York Times
February 14, 1952*

Organized protection for the American flamingo has been assured by the formation of a conservation group in the Bahamas, John H. Baker, president of the National Audubon Society, said yesterday. The bird, one of the most beautiful in the world, is a native of the Caribbean, being chiefly found in the Bahamas. Its feathers are predominantly rose-pink, with black tips visible in flight. It has long, slender legs with neck to match, and its beak resembles a reversed horse's hoof.

Survival of the bird has been more a matter of chance than of design. An alarming population decline, from more than 10,000 a little more than a decade ago to twenty today on the island Andros in the Bahamas, has prompted the formation of a Society for the Protection of the Flamingo in the Bahamas. A resident of Nassau, L. E. W. Forsythe, has been named president of the group.

Decimation of the flock began in 1938 when natives, after being forced out of work by a sponge disease that destroyed their regular means of livelihood, began hunting the birds extensively for food. The meat of young birds is considered best, and flamingo tongues are regarded as delicacies.

Added impetus was given to the decline when the birds were frightened by low-flying military planes during the war and by the "buzzing" of oil prospectors' planes since then. In their

the Kingfisher

the fish-eating birds and mammals. Thus we hear a sportsman condemn the kingfisher or the heron for eating the fish he would like to catch. Thereby, he believes, the birds spoil his own fishing.

As a matter of fact, these competing predators perform a great and necessary service. Whereas man is very selective as a fisherman, taking only certain species that he wants, the others take the easiest fish to catch. Any variety is accepted and the balance of fish in the

pond is thus maintained. Further, we have noted that fish produce huge numbers of young. The population problem in pond management is to prevent over-abundance and consequent reduction of growth. The fish predators help to do that and so perform a service. This is as it should be since this whole natural process evolved to keep animals and plants in balance and prevent them from destroying themselves. Next time the kingfisher rattles his way to your pond, take your hat off to him. He will help make better fishing for you.—From *Fish Ponds for the Farm*, by Frank C. Edminster.

I N T H E N E W S ★ ★

panic, the flamingos kicked over their low mud nests, destroying eggs in them. Many flew to refuge in other parts of the Caribbean and never returned.

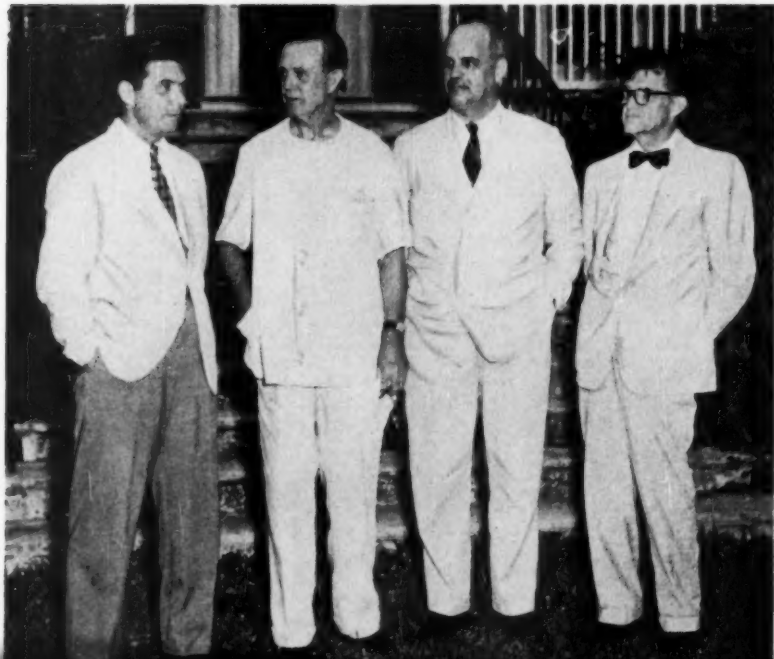
Employment of natives in a salt plant on Inagua Island, the Bahamas, is credited with preserving there the largest flock of flamingos extant. Of the 8,000 there, 5,000 are breeding, producing at most 2,600 offspring a year. Ornithologists have been unable to find any nests

on Andros, and assume the remaining birds are not breeding.

The flamingo has never been known to nest wild in the United States, although large groups of them were seen in Florida many years ago. The birds in Hialeah Park are captives.

Wardens hired by the Bahamas group will protect the flamingo by warning off potential hunters, and by attempting to curb the low-flying planes.

Conferring in Nassau about the new Society for the Protection of the Flamingo in the Bahamas are Robert P. Allen, research associate of the National Audubon Society; Arthur S. Vernay, chairman of the Bahamas group; John H. Baker, president of the National Audubon Society; and Dr. Herbert R. Mills, conservationist of Tampa, Florida.





A Wildlife

More and more, we must fight to preserve threatened wildlife near large cities. Here is an example of what two California women accomplished.

A female Costa's hummingbird with young ones. Photograph by Robert Leatherman.

By Marguerite Angelo Smelser

IN southern California, where rivers regularly run sandy side up during late summer, cities with lovely creeks flowing through them the year around are rare as hens' teeth. San Bernardino is one of those rare cities.

Below the great arrowhead landmark which trekking Mormons took to be a sign from God, and nestled at the foot of Mounts San Bernardino and San Geronio, is the city of San Bernardino. Close about her, in neighborly fashion, are her sister cities of Redlands, Riverside and Colton. Oldtimers in the valley can describe to you its abundance of brilliant birds, cougars, coyotes, cottonwoods, alders, tremendous oaks—mostly only a memory. But through the southern side of San Bernardino—now an expanding city of 89,000 population—there still flows Warm Creek, in whose miles of gentle waters generations of carefree children have waded and played.

Until less than two years ago, 300 acres of woods along Warm Creek adjacent to the city were constantly desecrated by gunfire. All forms of wildlife were fast disappearing. Even the beautiful egrets feeding in the stream were not spared. Pheasants were turned loose just before the hunting season opened and, having been raised in captivity, fell easy prey to men with guns.

Along with the pheasant slaughter, the hunters took potshots at any other living creature in sight. During the day, boys made raids with rifles and BB guns. At night, men with coon-hounds bedeviled the neighborhood with the hunting of opossums, raccoons and house cats till the dawn of day—cutting down native trees if need be to capture their quarry. Objectors were told nothing could be done—"it's legal."

Then two women on opposite sides of the city sought one another out—and something began to be done. Together they daringly determined on nothing short of a wildlife refuge. One, a high school biology instructor who thinks, lives and teaches conservation; the other, a newspaper columnist who then scarcely knew a jay-bird from a jail-bird but who loves all living things, put in two years of hard work securing names to petition, out-arguing shooters, explaining to city and county sportsmen, writing news articles, and organizing a branch of the National Audubon Society—a branch which grew with amazing and delightful rapidity, and which supported the wildlife refuge project with enthusiasm.

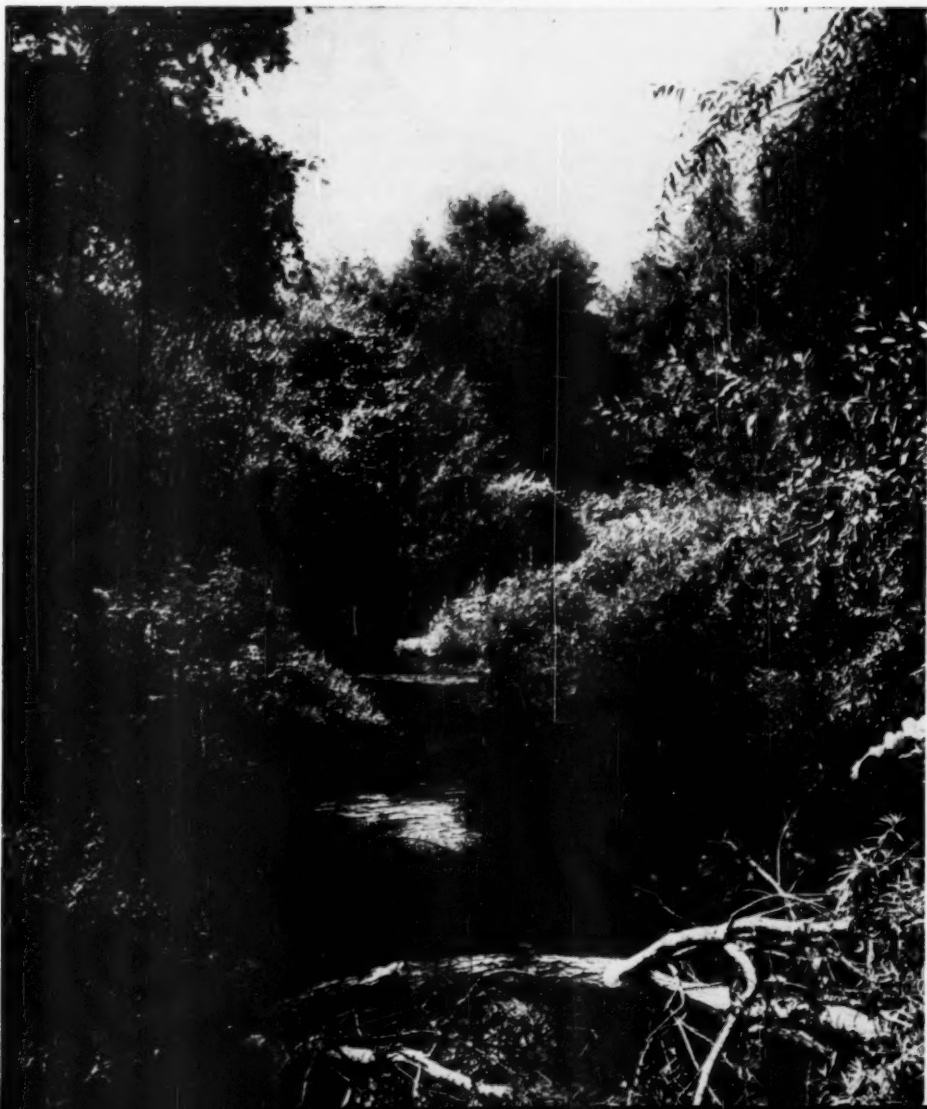
Up and down Warm Creek many property owners were almost pathetically eager to lease their lands to Audubon. They wanted an end to the dangerous shooting and depredation. But it was impossible

Refuge at your Doorstep

Dr. Harold M. Hill releases a
newly banded Cooper's hawk.
Photograph by John Lenker.



Streams, like lovely Warm Creek, are rare near cities
in southern California. Photograph by Arthur Miller.



to include them all because of the problem of patrolling. The county officials were not ready to sponsor an ordinance prohibiting hunting. However, they were very helpful in preparing legal descriptions of the 300 acres. Indeed, both the city and the county of San Bernardino were among the lessors.

The happy day of dedication, the crowning of concerted efforts, arrived October 20, 1950. Leases had been recorded, a hundred signs posted—Warm Creek Wildlife Refuge was a reality! While a movie camera clicked and news reporters scribbled, the Chairman of the County Board of Supervisors placed a large sign at the east entrance to the refuge—near the grounds of the renowned National Orange Show. Dignitaries spoke. John H. Baker was there in spirit, for a stirring telegram from him was read to the assembly during the program. As President of National Audubon, Mr. Baker had viewed the proposed refuge, and had circled its borders. He knew the hopes and fears of the founders.

As the dedicatory exercises proceeded these founders of the refuge saw a vision. In the preservation of the tangled woods traversed only by narrow animal trails, they saw the protection at last of the area's indigenous plants and animals; they saw here soul room for the city-weary, opportunity for nature study and education for the eager young. And yes, for the mature, too—*exempli gratia*: The San Bernardino Mayor *pro tem* dashed up at the last moment in a taxi. He glanced at the crowd and the natural, jungled woods piled with precious leaves and fallen branches. All heartiness and naivete he boomed out, "Congratulations to this fine civic-minded group. What a splendid improvement it will be to have this area at last cleaned up."

In the months since the dedication, the Mayor *pro tem* notwithstanding, the vision of the founders has materialized. For though San Bernardino is within 100 miles of three magnificent wildernesses, each comprised of thousands of acres for ecological studies, little Warm Creek Wildlife Refuge with its 300 acres of woodland is chummy and easily accessible to five cities within a few minutes' walk or drive. Girl Scouts,

Boy Scouts, biology students, scientists, and plain folks with the quality of appreciation have made field trips and explorations through this refuge—and the number is ever increasing. Hunting within the boundaries is now almost a thing of the past—though it still requires patrolling against poachers.

From its beginning, the San Bernardino Valley Audubon Society has been favored with a number of advantages. It received a favorable press. Its president is Dr. Harold M. Hill, a physician of high standing in the valley, a Screen Tour lecturer, and an authority on hawks and eagles. It drew from the experience and suggestions of Mrs. J. H. Comby of Whittier, then National Audubon's southern California representative. Among its members are several excellent nature photographers; a plant pathology technician who points out wonders in nature which others would pass over unaware; many school teachers who influence the young in the cause of conservation; and that biology teacher, mentioned earlier, who is now vice president and editor of the branch's monthly paper, *The Western Meadowlark*. Among the Society's friends is this writer's husband, who patrols the refuge for love of wildlife, not money. More and more boys and girls now look at nature with understanding because of his ability to pass on his knowledge of nature lore in fascinating fashion. We are the fortunate owners of a home, apart, on a cliff overlooking the entire refuge. When boys are seen visiting the area, down into the refuge this willing warden goes to "enlighten" them.

It is surprising and extremely gratifying to see how quickly a boy's attitude changes under proper guidance. And it is sometimes amusing. When they are introduced to the intellectual and emotional delight of studying tracks, and insect, bird and plant life, many of these boys become proud protectors of the area.

Not long ago a group of youngsters, new to the refuge, made a field trip there. Four "enlightened" boys stalked them at a discreet distance. When the new group started to cut down a sapling, the four pro-



Children have a new understanding of nature because of Warm Creek Wildlife Refuge. Photograph by Arthur Miller.

tectors stopped them immediately, explaining politely but firmly the rules of the refuge. Feeling like real wardens now, our heroes made their way down Warm Creek where next they saw a fire burning in the driftwood. With many a canful of water tediously carried from the creek, they did a good job of quenching the blaze. In fact, the Meeks and Daley Water Company's superintendent who was using the fire to free the channel of debris, had to spend the rest of the day to get it going again. But the boys were commended for their alertness and good intentions.

Boy and Girl Scouts from the surrounding cities have erected bird feeding stations, built birdhouses among the trees, painted signs to protect the rough-winged swallows during nesting seasons on the cliffs. Scientists from near-by Loma Linda Medical College study certain plants in the refuge in connection with their experimental work.

There are more than 200 species of flow-

ering plants to be found in Warm Creek Wildlife Refuge, according to Oscar F. Clarke, technician in the department of plant pathology at the University of California Experimental Station at Riverside. And more than 250 species of wild bees, according to Professor P. H. Timberlake, one of the world's foremost authorities, at whose heels this writer tagged one memorable day in the sanctuary.

Warm Creek Wildlife Refuge is a living museum, for in addition to the plant life which you would expect to find growing along a California creek, you will also find living specimens of other native plants usually occurring only in our foothills and mountain sides. For instance, here grow four kinds of sagebrush very seldom found in one place, to say nothing of growing in a thick woods like the refuge: *Artemisia californica*, *A. dracunculoides*, *A. tridentata*, *A. douglasiana* (*A. vulgaris*).

Floods from time to time carry these high-

land neighbors here to take root. Imagine finding a clump of terrestrial orchids within a half mile of a yucca plant! The first might be expected along the creek bottom, but the second is an immigrant from our mountain sides. This is *Yucca whipplei*, called "Our Lord's candlestick" by the early Spanish Californians. The great stalks of countless waxen yucca blossoms elicit the "oh's" and "ah's" of present-day tourists as they descend into San Bernardino Valley through Cajon Pass—the old Mormon trail. The west bluff of the refuge does produce some desert-like plants in its own right, such as cacti, bush buckwheat and *Haplopappus*, a member of the Composite family.

Southern California's seasons, like those in the Holy Land, bring "the early and the latter rains," to use the Biblical phrase. The result is not only a leafing out of the deciduous trees together with a "flowering spring" at the same time as spring occurs in the rest of the United States, but also an earlier "green spring" occurring about the beginning of winter. And so we have the green growth of fall and winter plants even when the cottonwoods in the refuge are bare.

There are more than 80 species of birds living in or visiting Warm Creek Wildlife Refuge at one season or another. There will be a bevy of California quail on the ground, spotted towhees in the bushes, sap-suckers in the treetops, a hawk sailing overhead, and perhaps a kingfisher swooping down on his fishful quest. Snowy and American egrets feed in Warm Creek, and use the refuge trees as a hostelry during the winter and early spring. They get ideas of bed early in the evening, and can be seen circling, each into his niche for the night. Bird watchers often come to the writer's second-floor sundeck to see the egrets check in. It makes a lovely sight—their snowy whiteness outlined against the dark trees.

There are birds of all sizes in the refuge, from hummingbirds to the big blue herons. There are birds of contrasting habitats: besides the ducks, coots, herons, and red-winged blackbirds in the stream and among the cattails, there is, in the open dry spaces,

an occasional roadrunner—that famous ground cuckoo of the southwestern deserts. If you don't glimpse this ungainly speedster, you may at least see the tracks of his strange feet—two toes in front and two behind.

In past years roadrunners were almost daily seen on the western edge of what is now Warm Creek Wildlife Refuge. Several at one time was no unusual sight. However, they were few by the time the refuge was established. Some sportsmen are out to exterminate these rare birds—legally, if possible, by getting the law protecting them repealed. In the meantime what is being done to the roadrunners is excused by the customary propaganda of hunters eager for more targets: "Roadrunners are deleterious to quail." The truth is, of course, that from time immemorial, roadrunners and quail lived among each other and they both flourished until the coming of the hunters themselves.

Those of you with a wildlife project close to your heart can understand that though Warm Creek Wildlife Refuge is in successful operation, nonetheless we who know its value are beset with apprehensions. What, we ponder, will be the future? Even constant vigilance cannot always save from the consumers what is left of earth's bounty. Will "progress" rape this museum on Warm Creek, this educational site for inculcating decent moral codes and a reverence for life in every form?

Very recently the combined efforts of the conservation-minded, a flood of letters from school children, and the oratory of indignant citizens directed to the city council were unable to save a group of great native Washingtonia palms in downtown San Bernardino. To get these palms 80 years ago, the early Catholic fathers journeyed to Mission San Gabriel—no mean jaunt in those days. These towering trees, dating back to early California statehood, painstakingly procured and so historically a part of this valley, were felled by an axe in a matter of minutes to make a little more parking space. And despite the years of effort and struggle of conservation groups, magnificent San Jacinto Wilderness is in grave danger of being lost to us as a true wilderness;

only a few last ditch defense points and a shortage of steel hold back the Palm Springs tramway with all its attendant commercialization.

A wildlife refuge at your doorstep affords a thousand delights—and a few disadvantages. For instance, your friends the opossums and raccoons won't "stay put" down in the sanctuary provided for them, but nightly climb the trial to your backyard fruits. And like Goldilocks, they sample several before finding the tidbit to tickle the royal taste. But in payment they leave cute little footprints in the garden paths; and in the rays of your flashlight Mr. Possum will "freeze" obligingly on the garden fence where you can admire him and even touch his shaggy coat if you like.

Then, too, if you are not up first, the kingly kingfisher feasts of a morning from your goldfish pools. And your husband,

with his fund of nature and Indian lore, is at the beck and call of boys and girls and organizations from near and far—there are times when you meet him only by appointment.

But you really don't mind too much, for though supper may grow cold, your heart warms up when a neighborhood urchin appears at the door. He is one of those who must take up where we leave off in this struggle to preserve what is left of that which we and our forebears slaughtered, chopped down, burned off, over-grazed, plowed up and cropped out. Your husband has been teaching him, and now, that teaching is bearing fruit. For though the urchin is a little mixed on terminology, he has grasped the Big Idea—with shining eyes he announces his errand:

"I want to join the Junior Abdomen Society!"

Generations of carefree youngsters have waded in the waters of Warm Creek. Photograph by Arthur Miller.



The President

By John H. Baker



reports to you

President of the National Audubon Society

PROGRESS IN CONSERVATION*

THE greatest progress made in conservation in our generation has been growing recognition of its basic relation to human welfare; the broadening of horizons and the scope of operations and goals of the organizations working in the conservation vineyard. No longer, as a rule, can we afford to compartmentalize our thinking or action and win, as a people, in the battle of life on this planet. No longer can we attain our ends by organizing for special purposes that represent a preferential interest conflicting with other preferential interests in the same general field. For example, no longer would it work to have a Society for the Preservation of the Cardinal warring with a Society for the Preservation of Sunflower Seed!

Conservation has been defined in a thousand and one ways on a thousand and one nights—so, I venture another: "Production and maintenance of an ever-better quality and ever-greater quantity per capita of the things man uses." The "per capita" is important; without it the gains would be swept away by too rapid growth in human population. Conservation would be meaningless and its pursuit apt to have ruinous results, if it were conceived of as measured by wealth expressed in terms of currencies of changing values. It is not to be attained by lessened human mental exercise.

To gain public backing of conservation practices involves effort and struggle—perhaps not much blood, but plenty of sweat

and some tears. In furthering these practices, it is not enough to be right and in possession of all the facts. It is also necessary to succeed in making friends and influencing people.

Now, the chemist produces, among other things, lethal compounds, such as DDT, used in the control of mosquitoes and other insects; 1080, used in the control of rodents and so-called predatory animals; other chemicals for control of aquatic life; fertilizers for agricultural use and chemicals for the purification of water. It is not enough that he succeed in producing chemicals that hit the immediate target; his education should include a sufficient understanding of the inter-relationships of natural resources to enable him to envision the ultimate effects, which may prove disastrous to man.

The doctor helps man overcome his diseases and injuries; he recognizes not only the importance of quality in food, but that nutritive content is more important than tonnage. It is not enough that he aid and save the sick and unfit. He should, through his education, recognize that man's recreational uses of natural resources can have deeply beneficial effects on his mind and spirit, let alone his physical health.

The physicist, in which I include the engineer, diverts rivers, controls water supplies, builds highways and dams, let alone agricultural machinery and other tools. Again, he may succeed in hitting the immediate target in such a way as to lead to disastrous ultimate results, if his education does not enable him to so plan as to avoid,

*Address by John H. Baker, President, National Audubon Society at International House, Berkeley, January 19, 1952, at a meeting of the California Conservation Council.

to maximum possible degree, adverse biological consequences.

The natural scientist has long been aware of the fundamental importance of basic research, but has not succeeded, generally speaking, in selling it to administrators. The latter are interested in getting the answer quickly and tend to be impatient with research; they may die or be out of office before the findings of the research become available to them; they are subjected to emotional and political pressures and, in most cases, are ignorant of the biological consequences of their own decisions. Now it is not enough that the natural scientist know how many tail feathers there are in a species of bird, how many points on the leaf of a kind of oak, whether a fish is anadromous or a bird passerine. If he is to favorably influence administrators, his education must have had wider scope than that limited to the indoor laboratory approach, and might well include elementary principles of successful salesmanship.

No two definitions of social science that I have ever heard are the same. We know it has to do with what makes human beings click. It involves knowledge of ways of successfully influencing people to live happily together. Since social science became a widely recognized profession, it has dealt primarily with people enjoying an ever-higher standard of living. It remains to be seen how successful social science may be in meeting the situation when the standard of living is ever lower, as, sooner or later, it surely will be if people do not practice conservation.

The conservationist needs the understanding and support of the chemist, doctor, physicist, the natural and social scientists and many others. In fact, men and women of all tastes, ages and occupations are in the same boat. Conservation affects the spiritual, physical and economic welfare of every man, woman and child, and their offspring; it affects the policies and activities of every nation, province, state, county or municipality.

Do you think that in getting legislative or administrative decisions, the issue is apt to be over whether or not to protect the

animal or plant? No, it is more apt to involve such considerations as the adoption of policies that take the emphasis off production now for maximum immediate revenue. It is essential to have allies and to sway the opposition, this whether the issue involves erosion, unwise drainage, wasteful lumbering, air or water pollution, overgrazing, excessive take of wildlife, the moving of routes for high tension power lines and highways, the construction of dams, diversion of rivers, or the establishment of national parks and wildlife refuges.

In wartime, the task of the conservationist becomes of increased significance, but far more difficult, because everybody and his brother tries, and with some success, to justify his pet exploitation as a defense project and top secret; also because the idea insidiously grows in administrative minds that production for war and revenue should be paramount to the extent that waste and long-range values no longer matter.

In accepting, working with and capitalizing on nature, we shall become healthier, wealthier and wiser, no matter at what time we go to bed or arise. And so, the subjects of chemistry, medicine, physics, natural and social science, conservation and many others are inextricably intertwined. Integration of conservation ideas with the thinking and teaching of all persons, of all professions, tastes and interests, seems to me essential. When every professor, assistant professor, instructor, superintendent, principal, supervisor, curriculum advisor and teacher, of whatever subject and whatever grade, has been educated to integrate conservation, we shall grow a human crop that will insist that its governmental representatives adopt policies and pursue practices that involve intelligent treatment and wise use of natural resources.

I am happy to pay tribute to you here in California as leaders in the procession toward this goal.

• • • PROCRASTINATION

For the last word in procrastination, go travel with a river reluctant to lose his freedom in the sea.—Aldo Leopold, "A Sand County Almanac."

PERILS OF THE FLYWAY*

By Robert S. Lemmon

THE thought of countless birds, many of them no longer than your hand, flying hundreds of thousands of miles each year in their migrations between North and South is fantastic enough in itself. But how much more thrilling it becomes when you realize that most of their journeying is done at night with only instinct and perhaps the stars to guide them, and that the way is beset with many grave dangers.

The worst perils of the flyways are not the obvious ones such as the talons of predatory hawks and the guns of hunters. The smaller and weaker species avoid these by traveling only after dark, leaving daylight migration largely to the waterfowl and other big, rugged fellows and to certain very swift fliers such as the swallows.

*Reprinted from "The Birds Are Yours," Macmillan Co., 1951, \$2.25, courtesy of the publisher and author.

From the Jacket Design of "The Birds Are Yours" by Robert S. Lemmon, illustrated by Don Eckelberry.

But this is a little like stepping out of the frying-pan into the fire, for night brings its own special risks, most of them involved with the weather. To illustrate:

Imagine the helplessness of a warbler or wren overtaken a quarter mile above the earth by a midnight thunderstorm or other sudden, violent wind. Unable to see the ground below, it must choose between a blind landing which may prove to be on a great lake or in the heart of a metropolitan city, and abandoning itself to the buffeting of the gale, which may be still more disastrous. Even if it survives the latter alternative, daylight may find it blown so far off course that return, in its weary, battered condition, may be next to impossible. The number of coastwise migrating birds that are carried out to sea and drowned under such circumstances is unknown, but conceivably it can be very great.

Also there is the peril of fog and the many, many collisions with man-made objects which it entails. Birds instinctively drop closer to the earth when visibility becomes poor, and then, unable to see where they are going, frequently fly into telegraph wires or against tall buildings and are killed or critically injured. Strong artificial lights have a fatal attraction for them in such bad weather; perhaps they think the glow shining through the murk is coming from the sun. One September morning after a night when dense fog had crept in unexpectedly from the sea I climbed the stairway to the top of Fire Island lighthouse, one of the tallest on the Atlantic Coast, and found nearly a hundred birds of different kinds on the catwalk below the great reflectors, all dead from crashing head-on into the glass.

There is no sure safeguard against these tragedies, but nature herself has provided a partial one by seeing to it that the heaviest night movements of the migration seasons are launched only on clear, calm evenings when treacherous weather along the route is unlikely to develop.



YOUR *Wildflower* GARDEN



In moist woodlands of early spring, wild plants are pushing through the softened earth. Photograph by John H. Gerard.

By Carol H. Woodward

IN moist woodlands where the sun in early spring shines through the leafless trees, wild plants pushing through the softened earth are now preparing to flower. After the green of skunk cabbages come delicate hepaticas, anemones and rue anemones, fragile flowers of bloodroot, dark mottled blooms of wild ginger concealed beneath their leaves, violets of many kinds. Across two-thirds of the country the first jack-in-the-pulpits arouse exclamations of delight. Jaunty columbines of diverse colors flower through a springtime which extends

from March in northern Florida to mid-June in Alaska.

The urge to transplant wildflowers to the garden is most irresistible when the plants are in full bloom. For some this is the least desirable time, but most of the early spring flowers can be quite safely moved.

The technique in digging them may well determine their survival. On all four sides, just beyond the spread of the leaves, a trowel should be plunged into the soil as deeply as it will go. Sometimes the ensnaring roots of near-by shrubs must be snipped before the plant can be lifted.

Wrapping it at once in wet paper will help to preserve the plant, especially if the roots have become at all exposed.

To dig plants carelessly or neglect them while they are getting accustomed to garden life amounts to vandalism. To grow them so well that they increase is a laudable accomplishment in conservation and in gardening. When the wildflower stock becomes too large, a portion of the plants may be passed on to fellow gardeners or returned to enrich the countryside from where they came.

Freshly dug plants need shielding from the sun until they are established in their new home. If they cannot be set out immediately, a gentle soaking will prevent their wilting. Where the new home for them will be is a question best decided in advance. Nearly every property has a shaded spot where woodland flowers will enhance the scene. If the ground is loosened and enriched, especially with leafmold, the flowers may give a better show of bloom than in the wild; that is, of course, if the site is to their liking. On a moist slope Dutchman's breeches will veil the ground with their airy flowers. But if transported to a dry location they will throw only

a feeble leaf year after year. They will never bloom, yet not quite die. Columbines, however, will tolerate a dry spot, especially if their roots can reach the smooth coolness of a rock. Wild ginger, in my experience, grows best on the east face of a slope, but that may be merely a local phenomenon.

As a "sod," fringed polygala carries well into a shady place, but will remain quite stationary if there is not an abundance of natural moisture in the soil. If a wet spot is in the sun, it is suitable for bright marsh marigolds in spring. These are easily transplanted, except that the digger may sink to his knees in mud in trying to reach them.

Hepaticas and anemones are slow to take hold in a new location. A deep bed of leaf-

American columbine, *Aquilegia canadensis*, is an excellent plant for the woodland rock garden. This species, growing wild from Texas northward and eastward, thrives equally well in sun or shade, in moist, moderately acid soils. It blooms from April to July and will tolerate a dry place if its roots can reach the smooth coolness of a rock.

The ruby-throated hummingbird is attracted to the scarlet flowers of columbine. Photograph by Allan D. Cruickshank.





Bloodroot, blooming in April and May, is one of our most easily grown wildflowers. It thrives particularly well in a rich, deep, moderately acid soil and propagates readily from seed, the plants of which bloom the second or third year after sowing. Dividing the root, preferably in autumn, will produce from two to three new plants each year.

mold will make them respond with better growth. Violets, on the other hand, are likely to take over a garden, whether in sun or shade. Let this be a warning to those who do not want their rarer plants crowded out.

Among the season's early flowers, the one most prized of all is the trailing arbutus. This perfumed treasure, which has almost disappeared from the wild, is not to be dug up. It takes unkindly to disturbance, and is, moreover, protected by law. This does not mean that it may not appear in wildflower gardens. A few persons have propagated trailing arbutus in sufficient quantity

The lone, erect flower buds of bloodroot arise from a leaf-cloak of silvery green. Photograph by Walter S. Chansler.



for distribution. Each additional gardener who cultivates it and increases the stock is doing a service in the conservation of one of America's best loved flowers.

Other spring wildflowers—protected by law in the majority of states where they occur—are, besides the dogwood tree and the mountain laurel, the wild orchids such as lady-slippers or moccasin-flowers, which are always risky to transplant. For these and many others a wise plan is to obtain them from a nursery.* Many other wildflowers are on conservation lists to prevent their being ruthlessly picked. The best rule to follow is never to transplant from the wild any plant that is not locally common and to take no more than one or two specimens. An exception would be a real estate development area where the plants are certain to be destroyed.

Each region of our country offers its gardeners a luxurious store of native wildflowers. Those that have been named here are but a fraction of the list that includes trillium (always best to obtain from a nursery), foamflower, bishop's cap, Virginia bluebells, blue phlox, toothwort and many others.

(To be continued in our next issue)

* For a three-cent stamp, Audubon Magazine will send a list of nurseries dealing in native plants.

HOME -



This young wood duck had been hatched for only a few hours when its picture was taken.

By Richard Stuart Phillips

ABOUT 150 years ago, an early settler-historian, writing of northern Ohio at the time the first settlements were being established, had this to say:

"It is possible to walk for stretches of a hundred miles and never leave the forest. Game animals abound and all the ponds and creeks are alive with waterfowl. There are many that are strange to me, but I saw swans and wild geese, black ducks, mallards, acorn ducks, shelldrakes, teal, butterbolts, loons, dippers and waterhens. The most numerous of these seemed to be the acorn or wood duck, a small, brightly colored, crested duck, that nests in hollow trees."*

These vast stretches of forest that once clothed eastern North America were slowly cut off by the settlers. They planted farm crops where the forests had been, and areas

that had been ponds became fertile fields. Gradually, with these changes, the wood duck, *Aix sponsa*, became a rarity. The wood duck did not decrease primarily from overshooting, poaching, or predators, but simply through the destruction of its habitat. A hole-nesting species, the birds breed only where there are hollow trees, ponds, and forest-bordered streams near which it likes to make its home. Most of the woodlands in the Middle West are watched carefully by landowners and as soon as a tree develops a defect or a cavity that would house a hole-nesting bird, it is felled and carted off to the mill.

By the close of the 19th century the wood duck was so rare that several states protected it from hunting. The federal government listed it as one of our vanishing species and also extended protection to it. The bird had become so scarce in the United States that quite a demand arose for the wood duck in America. To meet

* "History of Hancock County, Ohio," by C. R. Brown, Chicago, 1886.

BUILDER FOR WOOD DUCKS

All photographs, unless otherwise noted, courtesy of the Department of Conservation, State of Illinois.

this need an industry developed in Holland, where wood ducks were raised in captivity and shipped to the United States.

Slowly, during the past 25 years, the wood duck has increased until once again it is being hunted, but it has recovered no more than a fraction of its former numbers. The rise in the wood duck population may be attributed to our recognition of the bird's nesting requirements and to the interest of certain individuals and groups who have built wood duck nesting boxes and put them up for this beautiful hole-nesting species.

One of the most enthusiastic workers for the wood duck in the Middle West is Laurel Van Camp,* Ottawa County Game Protector for the state of Ohio. Van Camp first became interested in the plight of these beautiful waterfowl about 10 years ago. Since that time he has built and put up more than 100 nesting boxes in the Ohio area that he patrols, and he has built at least another 100 and sent them to other parts of the country to be put up where ducks can use them.

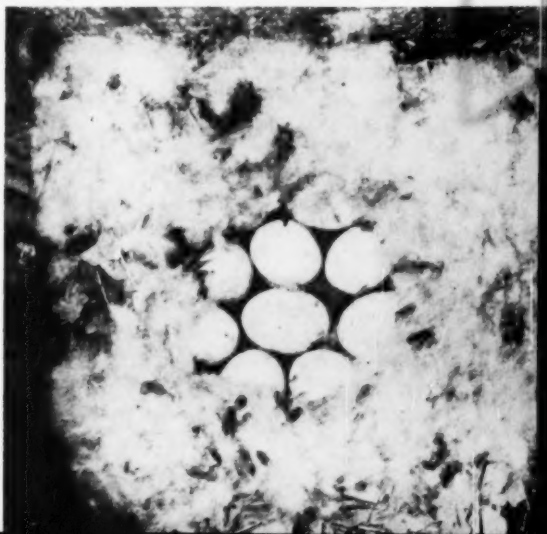
In suitable wood duck territory, 30 per cent of Van Camp's boxes are used by this duck. The remaining 70 per cent are occupied by raccoons, opossums, fox squirrels, red squirrels, deer mice, barn owls, screech owls, sparrow hawks, crested flycatchers, starlings, bluebirds, flickers, honeybees and bumblebees. The number of hole-nesting

* For a biographical sketch of Laurel Van Camp, see "Hawkman," *Audubon Magazine*, March-April 1949.



Frank Bellrose of the Illinois Natural History Survey lifts the detachable roof of a wood duck nesting box to examine the nest within.

Before leaving her nest to feed, the female wood duck covers the eggs with a blanket of down plucked from her own breast.





The female wood duck prepares to lead her brood out of the nest . . .

The first duckling peers out . . .



animals resorting to the wood duck boxes strikingly illustrates the scarcity of available nesting sites in hollow trees.

I asked Van Camp if he removed the nests of birds, other than wood ducks, and those of mammals from the wood duck boxes. He was appalled at my question.

"With the exception of boxes that are filled with bees," he replied, "or the debris of fox squirrels, I never bother them. It is against my theory. You see, I put up enough boxes so that there is one available for every animal that needs a nesting cavity."

In several places, where a screech owl has taken over a box in good wood duck territory, Van Camp has built another box in the same tree or in neighboring trees, so that both species may be accommodated. The boxes may be placed close together or far apart. In a one-half mile stretch of creek he has seven boxes. Five of these are occupied by wood ducks, one by a screech owl, and one by a sparrow hawk. Most of the boxes are placed 10 to 40 feet from the ground in trees. Van Camp has tried putting them on wooden posts, but the posts are often broken off by ice and debris during the winter and the boxes carried off by the spring freshets. In an area where raccoons are especially abundant, it is best to

put them on posts because raccoons will not nest in these boxes.

The log of his wood duck nesting project makes fascinating reading for anyone interested in the out-of-doors. I picked, at random, the notes covering one nesting box. *Wood Duck Box 11*

1944

March 18. Box erected on Sugar Creek.

May 10. Old wood duck on nest. 6 or more eggs.

Oct. 20. Red screech owl flew out.

Nov. 15. Dark gray screech owl roosting in box.

1945

March 8. Gray female owl roosting in box.

May 11. Old wood duck on nest. 11 eggs.

Sept. 30. Colony of honeybees in box.

Oct. 30. Kids took down box. Box shot full of holes with rifle and shotgun.

1946

Jan. 7. Box replaced.

Jan. 30. Gray screech owl roosting in box.

April 4. 9 wood duck eggs in box.

May 10. Eggs hatched.

June 1. Starling nesting in box.
Oct. 4. Red screech owl roosting in box.

1947

April 22. Female raccoon in box. Must have young.

May 18. Wood duck in box. 11 eggs.

July 28. Bees in box.

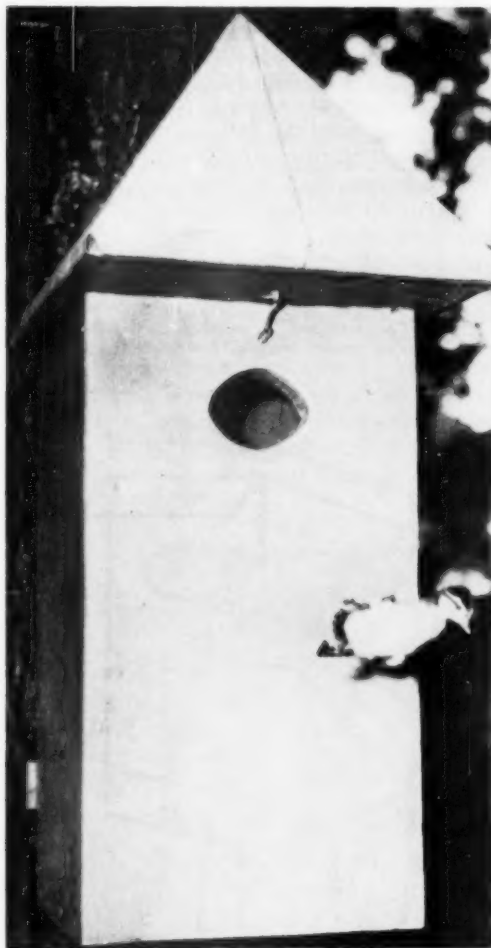
Nov. 26. Took box down to get bees.

1948

May 3. Wood duck flew off. 22 fresh eggs.

Two females laying?

And jumps! . . .



June 3. 11 eggs hatched, young gone. 11 eggs left in box.

Oct. 21. Large brown screech owl roosting in box.

Dec. 24. Gray screech owl now roosting in box.

1949

April 28. Starling nesting in box.

Dec. 7. Gray screech owl roosting in box.

1950

April 26. 5 wood duck eggs.

These nesting boxes are made from Van Camp's own design that has been improved through the years. Each box is 16 inches high at the back, 18 inches high at the front, and either 11 or 12 inches square. He uses rough lumber in their construction, one inch in thickness. The entrance hole is three inches high, five inches in width and cut to form an oval opening. Some people attach cleats to the inside walls of their wood duck houses to assist the young in getting up to the opening. Van Camp does not use cleats in his nesting boxes, having found that the young can get out without them. Just beneath the entrance hole he nails a strip of wood, two inches wide, to serve as a landing platform.

The top is formed of a sheet of heavy aluminum or galvanized metal that starts well down on the back of the box and is brought up and over to form the roof and allowed to project two inches in front of the box, bent at an angle to form an awn-

Safe on the water, he starts life bravely.



ing over the opening. All of the boxes are placed facing southeast to avoid the driving rains and snows of early spring. Two inches of dry sawdust or shavings are put in the bottom of each box. This is an important requirement, otherwise the birds will not accept the box as a nesting cavity. It is attached to the trunk of a tree with galvanized metal straps. It is a good idea to drive two or three spikes into the trees below the box to serve as an additional support.

There is a two-inch removable panel in the front of each box that allows the contents to be photographed. Through this opening the litter that any wintering fox squirrel accumulates may be removed. The wood ducks will not remove this pile of dead leaves. The board that is used for the panel has its upper edge cut at an angle so that water cannot seep down on the nest and young. Van Camp paints the boxes a dark, dull brown.

Nesting boxes should be up by *mid-March* as the ducks begin nesting during April. The greatest trouble that Van Camp has had is in concealing them from vandals. Each year several of his boxes are shattered by gunshots or deliberately pulled down from the trees and broken open, and this by "poor sport" sportsmen who are the ones most benefited by his program.

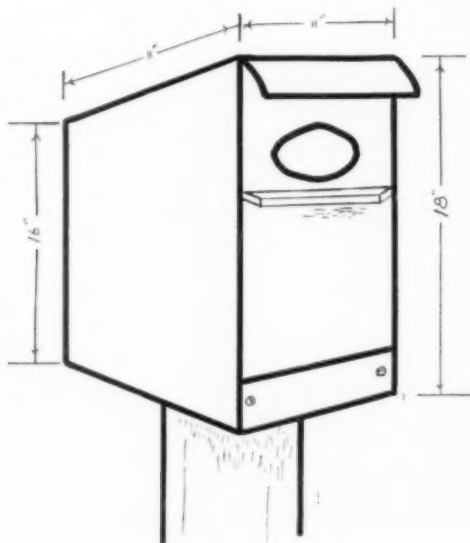
With the increase in the numbers of the wood duck within the last 10 years, the bird may some day approach its former abundance. "However," Van Camp stresses, "each year the birds' natural nesting conditions get worse. Each year more and more timber is cut and there are fewer and fewer natural cavities for them to use.

Van Camp's 100 boxes produce an average of 14 or 15 successful nestings each year. Several hundred projects such as Van Camp's, scattered over the eastern part of the country, would give the wood duck the opportunity to come back in real strength.

WOOD DUCK NESTING BOX

The wood duck nesting boxes made by Van Camp are of his own design.

Van Camp makes his wood duck nesting boxes of rough boards, one inch thick.



Photograph and sketch by the author.

MYTH-INFORMATION

By Lewis Wayne Walker

(Many wildlife myths and legends, built up by our early settlers around certain kinds of American birds and other animals, persist from generation to generation. In the sixth of a series, a writer-naturalist tells the true story underlying some pet beliefs.—The Editors)

Number 6 in a series

Scent Thrown With Tail

That a skunk saturates his tail with an effluvium, then adroitly flips it at his attacker is not an uncommon belief. It, too, is groundless. When in the act of spraying, a skunk's tail is held over the back and often drops across the animal's head. In fact, a skunk cannot spray at all if his tail is forced to the ground behind him. It also seems that a skunk has difficulty using his potent and effective means of defense when held by his tail off the ground. Some people say that he must have his feet on the ground in order to make the muscles work which compress the scent sacs. This I know to be wrong, as the spotted skunk will often walk on his front feet, with hind legs off the ground, when ready to "shoot the works." I rather believe that when held aloft by the tail a skunk's weight tends to keep the scent sac nipples from protruding. However, do not be misled into thinking that such a position automatically renders him harmless. I relied on the truth of that story and carried a skunk about 150 feet before he became enraged enough to prove to me that it was just another myth.



Suggestions for a small

By Monica de la Salle

EVEN with limited space and little money, a bird reference library is possible for anyone. It is necessary when choosing these books to think twice before buying them and to keep in mind the objective of this selected collection: a small research shelf from which as much information as possible can be found on a variety of subjects related to birds. It must be remembered that the newest books are not necessarily the best for this purpose. Many of us enjoy owning some of the fascinating "chatty" adventure books of the outdoors; but interesting as they may be, they will not give us the information which is sought when, returning from a walk or a trip, we are looking for the explanation of some chance observation.

Let us assume that you would like to have in a small space as much information about birds as possible. Assuming that you already own one of the field guides, you might begin your collection with: (1) A good ornithological textbook, and a general reference work. (2) A book on the life histories of North American birds illustrated in color, and a general book on bird habits and behavior. (3) One or two books for reading and where facts can be found. For these I would suggest:

1. "A Laboratory and Field Manual of Ornithology," by Olin Sewall Pettingill, Jr., Burgess Publishing Company, Minneapolis, Minnesota. \$3.50. "A Dictionary of Birds," by Alfred Newton, Adam and Charles Black, London, England. (Out of print; second-hand copies can be found for about \$6.00.)
2. "Birds of America," edited by T. G. Pearson, Garden City Publishing Company, New York. \$5.95.
"Birds and Their Attributes," by G. A. Allen, Marshall Jones Company, Frencestown, New Hampshire. \$4.00.
3. "Birds Over America," by Roger Tory Peterson, Dodd, Mead & Company, New York. \$6.00.
"This Fascinating Animal World," by Alan Devoe, McGraw-Hill Book Company, New York. \$3.75.

These six books will contain the answers to many more questions than the average bird enthusiast will ask and the cost should not exceed \$30.00. Assuming that you may already have these, what next? One could suggest a book on bird attracting and bird food, one on bird photography or bird drawing, any number of books on the behavior of birds, and perhaps one on the history of ornithology and one on the places where birds can be found in America. Any, or all, of the following books will be helpful:

"Birds in the Garden and How to Attract Them," by Margaret McKenny, University of Minnesota Press, Minneapolis. \$5.00.



Ornithological Reference Library

"American Wildlife and Plants," by A. C. Martin, H. Zim and A. L. Nelson, McGraw-Hill Book Company, New York. \$7.50.

"Photography Afield," by Omal I. Sprungman, The Stackpole Company, Harrisburg, Pennsylvania. \$7.50.

"How to Draw Birds," by Raymond Sheppard, Thomas Y. Crowell Company, New York. \$1.00.

"Bird Display and Behavior," by Edward A. Armstrong, Oxford University Press, New York. \$5.50.

"A Guide to Bird Songs," by Aretas A. Saunders, Doubleday & Company, New York. \$3.00.

"Book of Bird Life," by Arthur A. Allen, D. Van Nostrand Company, New York. \$4.00.

"Migration of Birds," by Frederick C. Lincoln, (Fish and Wildlife Circular #16), Government Printing Office, Washington, D. C. 35 cents.

"The Biology of Birds," by J. Arthur Thomson, The Macmillan Company, New York, 1923. (Out of print.)

"The Bird, Its Life and Structure," by Gertrud Hess, Greenberg, New York. \$4.00.

"History of American Ornithology Before Audubon," by Elsa Guerdrum Allen, American Philosophical Society, Philadelphia. New Series Vol. 41, Part 3. \$2.00.

"A Guide to Bird Finding East of the Mississippi," by Olin Sewall Pettingill, Jr., Oxford University Press, New York. \$5.00.



[In this and succeeding issues we bring you a test
of your ability to identify birds from photographs.]

PHOTO

Quiz

By Hugo H. Schroder

All photographs by the author.

The author, a well-known bird
photographer, asks about each
picture, "What bird is it?"

This is a striking, black and white shorebird with a slender *upturned* bill; it nests
widely in the West, and formerly nested east to New Jersey. What is it?





This should be easy. Named for Audubon, it is a member of the bird family, Falconidae.

FOR ANSWERS TO PHOTO QUIZ
SEE PAGE 136

Unlike most of its family, this bird spends a lot of time on the ground. The males of the species shown in this picture have black mustachial face-markings, otherwise this might be a photograph of a western bird to which it is very similar.





The American bittern sometimes nests in plant cover surrounding small but secluded ponds. Photograph by Clifford Matteson.

American Bittern— Genius of the Bog

The female bittern lays from three to seven eggs in a clutch, but four or five is the usual number. Photograph by Hal H. Harrison.



By Henry Marion Hall

THE racket in night swamps comes down to us unchanged from prehistoric times when morasses blanketed much of the planet. Marsh birds are comparatively low in the biological scale, and their cries are distinctly reptilian, reminding us of the creatures from which they are supposed to have developed. There is a family resemblance between the croaking of frogs, the bellow of bull alligators, the clatter of rails, and the multitudinous squawks, gurglings, and croaks of herons, snake-birds, cranes, and cormorants. Some are startling. The shrieking "K-r-r-eau! K-r-r-e-au!" of the limpkin sounds so like the scream of a woman being murdered, that it more than once drew searching parties into Florida bogs in the old days. In the North the laughter of the loon, equally unearthly, reminds us of black magic and demon wor-

ship, yet it is only the voice of night on pine-girdled lakes.

Most peculiar of marsh sounds, perhaps, is that made by the American bittern, locally called barrel-maker, marsh hen, plum pudd'n, dunk-a-doo, bog hen, thunder-pump, Indian hen and stake-driver. Most of these names have been suggested by the notes of the bird itself. Thoreau aptly dubbed the bittern "the genius of the bog." It is an inveterate hermit, lurking in remote or inaccessible morasses, shunning contact with man and even with its own kind. Most herons associate in large rookeries, numbering many hundreds, but one seldom finds more than two or three bitterns breeding in any square mile of fenland. In smaller patches of quagmire a single pair is the rule.

The bittern seems an integral part of the marsh. Black water is its favorite element; glowworms, foxfire, and will-o-the-wisps fur-

The bittern builds a platform of plant stems to support its nest in the cattail swamp. Photograph by Alan G. Gordon.



nish its familiar light. Look for it amid cattails, pickerel weed, water lilies, arrowhead and scented rushes—the haunts of cottonmouth moccasins, swamp rabbits, and terrapins.

Skulking in the morass it crouches as low as a muskrat and is equally inconspicuous. Sighting an intruder, the bird compresses its buffy plumage and apparently becomes a bit of weathered wood, its beak pointed skyward to match the tips of surrounding bulrushes. Dark stripes from throat to belly complete the camouflage. Standing thus a bittern will watch you for half an hour, motionless as its own background. Some scientists have even asserted that it will sway gently with the reeds whenever a breeze ripples through them. Whether or not this be true, it is obvious that the bittern tries to identify itself with the marsh. Its confidence in protective coloration and stance are such that one may approach it closely before it takes alarm and flutters away, with dangling legs and a squawk of expostulation. It is so much a part of the bog as to be positively fascinating.

The cry of the stake-driver is different from that of any other denizen of the fen. Most audible during the breeding season, it may be heard in the morning, or more insistently in the twilight, throughout summer and early fall. "Chunk-a-lunk!" "Chunk-a-lunk!" it is a trisyllabic call readily heard a quarter-of-a-mile away on still days. Beyond that distance the middle syllable is lost and the second sounds like, "Pump-up! Pump up!" or as commonly interpreted, "Plum Pudd'n! Plum Pudd'n!" At farther distances the cry is cut to the last syllable, a sort of "Chunk!" almost like the sound of an axe driving a stake in the mud, and giving significance to the familiar name of "stake-driver." Often, the notes remind one of an old wooden pump, obvious to any listener at short or middle distances, whereas the post driving is perhaps more convincing at long range.

Dissection shows that the skin of the neck and breast of a male bittern in spring is backed by muscular tissues used to compress and expel the air. This forms a bel-

lows as powerful as that of any serpent and equally reptilian. Close at hand the note of the bittern is so ejaculatory that it is difficult to recognize it as a love lay, but such it undoubtedly is. Whether the larynx has anything to do with the sound is doubtful, but at any rate no bassoon is more decidedly a wind instrument.

The bittern subsists on snakes, tadpoles, newts, frogs, fish, meadow-mice, shrews, and crayfish, varied by insects such as water boatmen, dragonflies, back-swimmers, grasshoppers and various nymphs. On the lookout for such boggy provender the bird will sometimes stand still for 15 minutes or so. Then it will take a quick step forward and impale its unwary victim. At other times it stalks slowly about, stooping low but ever ready to spear its prey.

This species lays down a platform of dead rushes about a foot in diameter on the floor of a cattail swamp, sometimes in a dry oasis but more frequently over shoal water. Deep, impassable morasses are favorite nesting areas, but one may find nests also in cover surrounding small but secluded ponds. On one such tarn near Hopewell Junction, New York, I recently discovered two within half a furlong of each other. To locate them I waded in a trifle more than hip-deep in sable-black water, brushing aside the caney reeds until the birds flushed. This lakelet is nearly round and encircled by alders.

Coming suddenly on the first nest I surprised a hen bittern which flapped away with a squawk like a night heron, and squirting white guano as it gathered speed. The nest held four fresh eggs on the eighth of May. The place is remarkable for the large number of red-winged blackbirds which weave their cradles in the reeds and for bullfrogs of aldermanic girth. These batrachians kept splashing in ahead of me with spasmodic chirps. Presently I approached a lot of large, grassy mounds, round as pincushions surrounded by stagnant water green with duckweed. From one of these another bittern sprang noisily, leaving behind three freshly laid eggs in a slight but unlined depression.

Exploring a smaller pond half-a-mile away, I spotted a sort of basket well out over the surface in a belt of canes. On this lay what looked like a few handfuls of flotsam left there by higher water. Wading closer I was surprised to see this bunch of tawny feathers suddenly take the shape of a bittern and fly away as the others had done. This rushy cradle contained five fresh eggs at that time. Both tarns are the haunt of pied-billed grebes, whose floating nests, looking like half-submerged muskrat houses, are attached to stalks about 15 paces from land.

Although the brooding bitterns thereabouts fled at my approach, these birds do not always react that way. Hearing a bittern sounding off in a cattail patch near the Red Inn at Provincetown, Mass., I once plodded some 50 paces through half-drowned flags and saw the female bittern squatting on her nest just out of the wet. She had five fresh eggs which she was as ready to protect as she later protected her young. Hissing like a rattler she struck boldly with her long mandibles, and flew away most reluctantly.

Bitterns occasionally break trails to their

Continued on Page 136

The buffy youngsters lack the darker stripe-like markings of the adult birds, but look equally reptilian. Photograph by Morrau Studio.





California murres. Photograph by William L. Dawson.

OIL *and the California Murre*

By Frances Houldson

ON HIS latest tour of the Farallone Islands, Dr. G. D. Hanna of the California Academy of Sciences reported the birdlife there to be apparently stable. Thanks to the efforts of the Golden Gate Audubon Society, the U.S. Coast Guard, the U.S. Navy Department and California State officials, nesting sea birds of the Farallone Islands are no longer exposed to the menace of floating oil.

Several years ago a great oil slick threatened to exterminate the California murre. These birds were seriously affected when they dived beneath the oil surface for their

Holboell's grebe killed by the effects of oil. Photographed at Jones Beach, Long Island, by Stanley Grierson.





Before the birds were protected, murre's eggs once sold for \$2.00 a dozen.

The little, starling-sized dovebies, smallest of the wintering sea-birds, are often destroyed by floating oil. Photograph by George Komorowski.



food: they lost their ability to fly, their flesh was exposed to the chilly water and fiercely cold winds, and their bodies became coated with oil which they carried back to their young. Countless murres perished, and as their numbers decreased, gulls ate their eggs and young. The chief protection of the murres had been mass numbers on the breeding cliffs, but finding a single bird, the gulls would harass it from all sides.

The mass of oil came from tankers discharging their salt water ballast on return trips to San Francisco. It was illegal to discharge the oily ballast in San Francisco Bay, hence the tanks were emptied near the Farallones as the vessels approached the Golden Gate. The gulls were not affected as they do not dive below the surface.

The pitiful condition of the oil-soaked murres was first noted here in 1917. At that time Captain H. C. Rhodes, superintendent of the San Francisco lighthouse district, notified the newly formed Audubon Association of the Pacific (now called the Golden Gate Audubon Society), and this group went to work on the problem.

A committee composed of president C. B. Lastreto, Dr. B. W. Everman of the California Academy of Sciences, and members representing the Cooper Ornithological Club, approached the major oil companies and requested cooperation to prevent further oiling of the Farallone birds. Efforts were fruitless at first, then one oil company hit upon a plan that would not only save the diving birds, but would also prevent the extravagance of wasted oil. The skippers were ordered to pump the ballast from the *bottom* of the tank instead of from the top as formerly, and to stop the pumps when the line of floating oil was reached. Shore tanks were installed and the balance—water heavy with oil—was pumped into these shore tanks and saved for further use by a settling process. All other companies quickly followed suit and built their own settling tanks in the Richmond hills.

As late as 1934, the California murre was reported as being one of the least abundant birds on the Farallone Islands, but the prevention of oil pollution has been so successful that murres now appear there in

A razor-billed auk and four dovekeys killed by oil along the coast of Long Island, New York. Photograph by Stanley Grierson.



An oiled gannet, pathetic in its plight, defiantly faces the photographer. Photograph by George Komorowski.



thousands and can hold their own against the gulls. Their pear-shaped eggs are remarkably adapted for the perilous positions in which they are laid, and have an extremely hard shell. These eggs once brought \$2.00 a dozen on the San Francisco market and an estimated three or four million had been shipped out of there by 1856. After that, 180,000 to 300,000 were collected for the egg market annually, and all eggs were destroyed at the beginning of each season to assure freshness in all eggs gathered. In 1890, the colonies of murre were so depleted that the islands were made a federal bird reservation to save the birds from extinction.

Another oil problem on the Pacific coast, described in *Bird-Lore*, March-April, 1938, and in *California Fish and Game*, July, 1938, told of tankers wrecked in or near San Francisco Bay. These articles referred particularly to the wreckage of the tanker

Frank H. Buck in the Golden Gate, and the subsequent pollution of 55 miles of coastline and several small bays and lagoons. At least 6,600 murre were killed on the coast, but the oil belt did not extend more than 15 or 20 miles to sea and did not pollute the waters near the Farallones, which are about 28 miles offshore. Much of the cargo of 65,000 barrels of crude oil drifted into shallow bays and lagoons to kill hundreds of loons, ducks and grebes of various species.

At the present time, there does not seem to be any way of preventing the menace of floating oil discharged from wrecked ships. Perhaps the solution to this problem may lie in the scientific development of a different type of marine fuel—say, atom power—but until then, the discharge of oil into settling tanks on shore is one way to prevent the destruction of many water birds along our coasts.



***YOU TRY IT!**

8
POWER
30 MM.
ONLY
\$9.95
with Super-coated obj. \$12.95

9x50
\$17.95

Prepaid—C.O.D., \$2 deposit

*** TRY 5 DAYS.** Money back if you don't agree it's the greatest optical value ever. CASE INCLUDED without extra charge. Tough, long-wearing. Limited quantity—get in your order while cases last!

PRISMASCOPE
Prismatic Telescope

DU MAURIER CO., Dept. 353, Elmira, N. Y.

Made in U. S. A.

*** USE this great NEW PRISMATIC MONOCULAR** to appreciate its unbelievable clarity, brilliance, terrific power! 5 of the finest lenses, plus 2 prisms made for binoculars retailing to \$150, bring objects miles away right up close. Marvelous for touring, nature study, hunting or other use demanding exacting performance. Same results as binocular, but for one eye. Adjustable eyepiece permits razor-sharp focus—huge objective of tremendous light gathering power provides super brilliancy from dawn to dark. AS PURCHASED BY U. S. GOV'T!

WORTH MANY TIMES PRICE ASKED
Only DuMaurier master craftsmanship with 36 years experience in optical manufacturing, plus a fortunate purchase, make low price possible. Slight irregularities in some elements are so compensated that every glass sells with lifetime guarantee. Don't buy miniature makeshifts when now, at this amazingly low price, you can have the power-packed results that only a large precision glass can give. Handy neck lanyard included Free. 8 x 30, 3 3/4" high, 6 1/2 oz., \$9.95 (with supercoated objective, \$12.95); 9 x 50, 6 1/4" high, 10 oz., \$17.95. Tax Free.

When writing advertisers, please mention Audubon Magazine



Something new in nest boxes

By Edwin A. Mason

A LONG lifetime filled with a keen interest in birds eventually resulted in a most unorthodox nest box for tree swallows. Henry E. Kinney's observations of the birds that were attracted to the boxes he made, beginning when he was a boy, resulted in many modifications of design. Every winter for more than 50 years Henry Kinney built boxes on his farm just outside Worcester, Massachusetts. Every spring these were added to ones previously built, until eventually, on an area of not more than two acres, he attained a colony of tree swallows estimated at 600.

Every winter for more than 50 years, Henry Kinney built nest boxes on his farm in Massachusetts. Photograph by Edwin A. Mason.

The dimensions usually recommended for nest boxes are based on natural cavities that have been occupied by the different species. Those for the tree swallow and bluebird are based on abandoned woodpecker cavities. When you stop to think, it is very obvious that the birds unable to dig their own nesting holes had little choice—they had to use what was available. Tree swallows and bluebirds usually use abandoned woodpecker nest sites.

As Henry Kinney watched over his beloved tree swallow colony, he pondered over the necessity of the adults to range far and wide to gather insect food for their young. He noticed that all went well during periods of good weather. He noticed also that very often when long wet spells occurred, with a diminution of the insect food supply, he sometimes had nestling mortality. During such periods the parent birds were gone for longer than usual periods. The really crucial time was when the nestlings were half grown. At the halfway stage of growth, and until they leave the nest, young birds need large quantities of food to build bone and tissue, and to grow the full complement of feathers necessary for them to fly away





Tree swallows usually used abandoned woodpecker nesting holes.
Photograph by Allan D. Cruickshank.

from the nest. During inclement weather it is difficult for the parent birds to fill their stomachs. Then, very often, it is only the strongest, most vigorous nestlings that are able to scramble to the nest hole to receive food, with the result that sometimes smaller, weaker ones succumb.

Eventually Henry Kinney was satisfied that he had gone a long way toward licking this problem. He reasoned this way: "If I make four holes in the front of the box, instead of one, it will make it impossible for the largest, strongest nestling to monopolize all the food delivered to the box. Also the parents will be able to begin earlier their practice of hovering at the entrance to feed the nestlings, instead of entering the box. This makes for a quick turn

IT'S THRILLING . . .



and exciting to have a pair of tree swallows nest in your yard, year after year. Our coneat swallow house actually lures this "hard-to-get" bird to nest in your yard. Money back guarantee if it doesn't. Write for free folder.

J. H. MURA CO., DEPT. A
1627 N. Main Street
RACINE, WISCONSIN



Write for free
folder on various
other feeders

ATTRACT
WILD BIRDS
TO YOUR
GARDEN
WITH OUR
PATENTED
AUTOMATIC
FEEDERS

audubon  workshop

INCORPORATED

4931 N. Kentucky DEPT. A Chicago 30, Ill.

PATRONIZE AUDUBON MAGAZINE
ADVERTISERS!

*They are helping to build the magazine and
deserve your support.*

To Let for a Song

Many thousands of bird houses are put up but few are chosen by the birds. HYDHOMES are preferred because they are scientifically constructed. Buy and erect now for Spring brood. Start your own sanctuary with these popular HYDHOMES.



THE WREN

Elliptical hole especially for House and Bewick's Wren.
\$3.75 - P.P.



Special Price!

\$10.50

Delivers all 3
HYDHOMES
- Postpaid!



THE CHICKADEE

For Chickadee, Nuthatch, Downy Woodpecker, Carolina Wren or Titmouse.

\$3.75 - P.P.

THE BLUEBIRD

For Bluebird, Tree or Violet Green Swallow.

\$3.75 - P.P.

HYDHOMES are guaranteed—ready to use—meet all requirements of U. S. Dept. of Agriculture and all Audubon Societies. HYDHOMES shown: Width 5 1/4", Depth 7", Height 11 1/4". Bottoms removable for quick, easy cleaning. Full instruction and hardware for use included.

Postal Card
Brings

FREE CATALOG

• HYDHOMES
• HYDFOODS
• HYDFEEDERS

HYDE BIRD FEEDER CO.

36 FELTON ST.,
WALTHAM, MASS.

When writing advertisers, please mention Audubon Magazine

A Set of 50 New

Audubon Wildflower

Cards

in full
color

(For Eastern
North America)



50 Beautiful Wildflower Portraits, Postal Card Size, in full color, from original paintings by LEE ADAMS. Descriptive texts on reverse sides. Splendid as teaching aids, and for use in identification and decoration.

Jack-in-the-pulpit
Broad-leaved Arrowhead
Pickerelweed
Canada Lily
Yellow Clintonia
False Spikenard
Canada Mayflower
Solomon's Seal
Purple Trillium
Painted Trillium
Blue Flag
Moccasin Flower
Spring Beauty
Large Yellow Pond-lily
Sweet-scented Water-lily
Tall Buttercup
Rue-anemone
Liver-leaf, Hepatica
Wood-anemone
Marsh Marigold
Columbine
May Apple
Bloodroot
Dutchman's-breeches
Wild Strawberry
Common Cinquefoil

White Clover
Groundnut
Wild Geranium
Marsh Blue Violet
Fireweed
Common Evening
Primrose
Wild Carrot
Yellow Loosestrife
Closed Gentian
Hedge Bindweed
Oswego Tea
Black Nightshade
Jimsonweed
Butter-and-eggs
Wood Betony
Hlurta
Cardinal-flower
Joe-pye-weed
Canada Goldenrod
New England Aster
Black-eyed Susan
Ox-eye Daisy
Common Thistle
Orange Hawkweed
Field Hawkweed

National Audubon Society
1000 Fifth Avenue, New York 28, N. Y.

Enclosed please find \$..... (check or money order;
no C.O.D.'s) for which please send me..... boxes of
the Audubon Wildflower cards, priced at \$1.50 per box.

Name
Please print

Address

around, with more time available for hunting food during those crucial wet periods when insects are hard to find."

It was sound reasoning—and it worked. A higher percentage of nestlings flew away from his new-fangled boxes. Also a bigger number returned the next spring. This was wildlife management of an insectivorous bird at work, and successful management at that.

The front of a Kinney nest box has four holes in it. Yes, that's right, four holes. Three of them are one inch in diameter, the other 1½ inches horizontally, and rasped out to 1¾ vertically. This is the main entrance for the adults. Experience indicates that this main hole can be the customary 1½ inch in diameter. Also, it may be that the addition of only two of the inch-size holes would suffice.

Another striking departure from customary designing is the 6¾ x 11 inch dimension of the bottom of the box. The back of the box is five inches high, the front 7½ inches, hence there is a pitch in the roof to the rear. The side pieces extend out beyond the front to protect the holes from driving rain, while further protection is provided by a 4-inch visor which is attached to the roof of the box at a downward angle. Either the rear or a side should be attached for easy removal. A narrow

Each spring, Henry Kinney's extra nest boxes attract more tree swallows. On less than two acres he now has a colony of 600 birds. Photograph by Edwin A. Mason.



strip of wood is nailed beneath the holes to provide a perch for the adults as they feed the young. Another narrow strip of wood is attached diagonally from a front corner to a rear one on the roof of the box. This serves to keep the adults from being blown off when they use the roof as a sun porch during the early stages of the nesting cycle.

The male tree swallow likes to sit perched near his nest box, especially during the period of incubation. Mr. Kinney noted this, and his answer is an upright of wood about half an inch square nailed to one side of the box and extending about six inches above the roof. At the top of this a cross-piece four inches long is nailed to make a "T" shaped perch. School children visiting the Massachusetts Audubon Society's Arcadia Wildlife Sanctuary in Northampton, quickly named this "the tree swallow's television antenna." The wood used in the original Kinney boxes was either half-inch or three-quarters; it could be up to one inch in thickness.

Nest boxes for tree swallows or bluebirds should always be placed in open areas, as far from trees and shrubs as possible. They can be on poles or pipes, the latter making them safer from climbing marauders. Although Mr. Kinney had his on poles, 10 feet high, eight feet from the ground would be acceptable. Certainly boxes at that height would be easier to clean out.

And now a word about when to clean out nest boxes. Based on the results of a 10-year study carried on at the Wharton Bird Banding Station at Groton, Massachusetts, certain recommendations were published in a paper in *The Journal of Wildlife Management*. So as to avoid confusion, those recommendations are restated here in the simplest possible terms. Do not clean out nest boxes until as late in spring as possible. When the birds return to nest, make that the occasion to clean out last year's old nests. Just merely sweep the contents of the box to the ground. In any event do not burn the material. If it would be unsightly just dumped to the ground beneath the nest box, dispose of the old nest somewhere outdoors.

When writing advertisers, please mention Audubon Magazine

Tempt the winter birds to visit you regularly

Encourage them with a daily supply of Kellogg's wild bird seed. You will not only enjoy their visits, but you will help these feathered guests safely through the winter. Help preserve the birds and they will repay you bountifully in the spring and summer by ridding your trees and garden of thousands of insect pests.

Kellogg's Audubon Society Mixture—

5 lbs.	\$1.30
10 lbs.	2.25
25 lbs.	5.00

"Little Joe" Sunflower Seed—small, black and meaty—

5 lbs.	\$1.35
10 lbs.	2.30
25 lbs.	5.10

Kellogg's "Economy" Mixture—

5 lb. bag	\$1.00
10 lb. bag	1.70
25 lb. bag	3.60

Above are prices per package, delivered to your home by parcel post—5¢ per pound higher if West of Rocky Mountains.

Send check or money order to
KELLOGG SEED COMPANY
 320 E. Florida St., Milwaukee 1, Wis.



Cedar Log Wren Houses

Furniturecraft Bird Homes bring welcome feathered friends to your garden . . . Seaucy Wrens inspect them and move right in! Kiln-dried Cedar Logs, strong, rugged construction . . . need no painting, resists moisture and exposure. . . . Very Easy to Clean.

ALL CEDAR LOG BIRD HOMES are packed TWO to a CARTON and shipped POSTPAID.

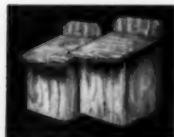
WR-6 \$2.50
6" x 6" pr. ppd.

WR-8 \$3.50
8" x 8" pr. ppd.

BR-9 8" x 8" BLUE BIRD HOUSES \$3.50 pr. ppd.

Redwood SALT BOX WREN HOUSES

Packed TWO to a CARTON
 WR-3 4" x 5" \$1.45 pr. ppd.
 Rugged construction. Easy to put up, attach to porch, post, or hang in tree.



No C.O.D.'s Please. MONEY BACK GUARANTEE
 "Our Goods Must Make Good or We Will"

Bank Ref.: First Merchants National
 Bank and Trust Co., Lafayette, Ind.



FURNITURECRAFT
 P. O. BOX 647 LAFAYETTE, IND.

A MESSAGE TO—

Summer Camp Directors

In recent years more and more Camp Directors have come to us for aid in working out a lively and vital nature program for their summer camps. Now, we have a real double-header to help accomplish this purpose.

1. Audubon Junior Clubs. Here is a tailor-made nature program, including a wealth of leadership material for your nature counselor, plus individual nature leaflets, colored pictures, a membership certificate and a club button for each child in the club. IN ADDITION, each camp forming a club receives a SPECIAL EIGHT-PAGE LEAFLET of nature projects and activities especially designed for summer camps.

2. Audubon Camps. These are conducted in Maine, Connecticut, and California for youth leaders and operate on a basis of five 2-week sessions each summer. The first session at each of these camps is planned particularly for *summer camp counselors*, and the dates are set early enough in the season so that counselors may have this training and still be at their own camps in time for the opening date.

For further details, write to:

NATIONAL AUDUBON SOCIETY
1000 Fifth Avenue
New York 28, N. Y.



The reason for this recommendation is to safeguard the brood stock of a small parasitic wasp known as *Mormoniella vitripennis*. This small wasp is a natural control of a fly known as *Protocalliphora** which is itself parasitic on nestling birds. We shall call them Proto and Mormo from here on for convenience.

Proto adults look something like houseflies. They lay eggs in bird nests, probably just after the young are newly hatched. Almost immediately Proto's eggs, which look like small grass seeds, hatch into tiny maggots. These small maggots attach themselves to the nestling birds and suck their blood for food. They then drop down into the nest material until they are again hungry. As many as 430 such maggots were counted in one tree swallow nest.

When the Proto maggots are fairly well grown, along comes the little wasp Mormo. Mormo lays its eggs on the Proto maggot. The Mormo egg hatches into a really minute maggot, which begins to feed on the Proto maggot, working from the inside.

Eventually the Proto maggot changes, just as caterpillars do, into the pupa or resting stage before the new adult emerges. If you examine a bird nest and find these small, cigar-shaped, brownish pupa cases about the size of a grain of wheat, you may find some with what appear to be pinholes in them. Through such holes the adult Mormo wasps emerge. Some may come out in the summer, but some will remain there as tiny maggots until the next spring. It is to safeguard these Mormo maggots that we recommend no bird nest box cleaning until spring, and then no destroying of the material.

The increase in feeding efficiency made possible by the multiple holes of a Kinney nest box, could mean the difference between nestlings living or dying, if a heavy infestation of the blood-sucking Proto maggots were present when there also was a dire shortage of food due to inclement weather.

The first Kinney nest boxes tested at Arcadia Wildlife Sanctuary were nailed to a

*I have just learned that entomologists have reclassified this bird nest parasite and have put it in the genus *Apau-lina*.—The author.

cross-arm on a post. On the other side of the cross-arm was a typical bluebird-type house. The tree swallows in both instances occupied the Kinney houses, leaving the old style ones severely alone. A later test with 10 Kinney houses was not as conclusive. Due to illness, proper observation was not possible, so reasons for the poorer showing are not known. Three other stations reported on Kinney boxes. In one instance both tree swallows and bluebirds looked it over but did not use it. The Kinney box attracted tree swallows in the next instance, in fact they built two nests during the season, only to be evicted both times by house sparrows. The report from the third station was that tree swallows and bluebirds fought for possession immediately the box was erected, the tree swallows eventually winning and raising a brood successfully. After this brood left, the box was immediately occupied by the bluebirds, which also raised a brood. Another box was built at this time. It was taken over right away by house wrens that presumably raised their second brood of the season in it. This box was most likely near shrubbery or trees, hence our recommendation for placing boxes in open situations if tree swallows or bluebirds are desired.

Well, there you have the story of the Kinney nest box. If you have a drop or two of pioneering blood in you, and are handy with tools, maybe you would like to try one out. If there is a better bird box, we're betting the birds have been looking for it these many years.



GREGOR'S HUMMINGBIRD FEEDERS

Attract those fascinating little birds. Keep them coming back to your garden all summer, even if you live as far north as Canada. A thoughtful gift for bird and flower lovers, children and invalids. Reservoir type, as used professionally, *eliminates constant refilling*. Two feeders attractively boxed, complete instructions, \$2.00 postpaid.

J. W. GREGOR

Townline Road, Nanuet, New York

FOR SALE

Lifetime Ownership of Cabin in Natural Area

One-room hilltop cabin with large stone fireplace in Berkshire foothills of Connecticut for sale for lifetime use of purchaser. Purchase would carry with it limited rights to entire 400-acre Natural Area, within the restrictions recommended by the Nature Conservancy. Only a person with a professional or amateur interest in natural history or some science related to it will be considered. For details write

Dr. Frank E. Egler

American Museum of Natural History, New York 24, N. Y.

George S. White & Co., Inc.

5 Highland Place, Maplewood, N. J.

Insurance Brokers

Specializing in providing proper coverage and reducing costs for thousands of satisfied customers. Cameras and binoculars insured.

PATRONIZE AUDUBON MAGAZINE ADVERTISERS!

They are helping to build the magazine and deserve your support.



Leitz 8x30, Flyweight
Binuxit binoculars,
\$135, plus tax

**brilliance,
clarity, power!**

Leitz

**COATED PRISM
BINOCULARS**

Made with the same
supreme optical precision
as the world-famous Leica
camera and Leitz microscopes.
Complete line available from opera
glasses to night hunting glasses, with center-
wheel or individual eyepiece focusing.
Coated optics give unsurpassed clarity
and brilliance. Full range of magnifications from 4 x 20 to 15 x 60. For
free descriptive folder write Dept. A1

E. LEITZ, Inc.
304 Hudson St.
New York 13, N. Y.

When writing advertisers, please mention Audubon Magazine

**The following books—
advertised in this issue—
are available from the
NATIONAL
AUDUBON SOCIETY**

SEARCH FOR THE SPINY BAB- LER, by Dillon Ripley	\$4.00
WILDLIFE IN COLOR, by Roger Tory Peterson	3.00
BIRDS' NESTS, by Richard Head- strom	2.75
BIRDS' NESTS OF THE WEST, by Richard Headstrom	3.00
THE LIVING YEAR, by Richard Headstrom	3.00
AMPHIBIANS OF WESTERN NORTH AMERICA, by Robert Stebbins	7.50
THE DUSKY-FOOTED WOOD RAT, by Jean M. Linsdale and L. P. Tevis, Jr.	7.50
THE CALIFORNIA GROUND SQUIRREL, by Jean M. Lins- dale	5.00
MAMMALS OF NEVADA, by E. Raymond Hall	7.50
LIFELONG BOYHOOD, by Loye Miller	2.75
A GUIDE TO BIRD FINDING EAST OF THE MISSISSIPPI, by Olin Sewall Pettingill, Jr.	5.00
WILD WINGS, by Frank S. Stuart THE NATURE DICTIONARY, by John H. Melady	3.50 2.00
HISTORY OF AMERICAN ORNI- THOLOGY BEFORE AUDU- BON, by Elsa Guerdrum Allen	2.00
THE FLIGHT OF BIRDS, by John H. Storer	2.50
THE SANDHILL CRANES, by L. H. Walkinshaw	3.50

SERVICE DEPARTMENT

**NATIONAL AUDUBON
SOCIETY**

1000 FIFTH AVENUE
NEW YORK 28, N. Y.



Book Notes

By Monica de la Salle

We are again printing a guest review, by a guest reviewer, Roger Tory Peterson, an Audubon Screen Tour Lecturer and well-known bird artist. His lead review of "Arizona and its Bird Life" is followed by the book notes of the Librarian at Audubon House, Mrs. de la Salle. —The Editors.

ARIZONA AND ITS BIRD LIFE

By Herbert Brandt, Bird Research Foundation, Cleveland, Ohio, 1951. 10 x 7½ in., 740 pp. Twenty color plates by Allan Brooks, Roger Tory Peterson, Terrence Shortt and George Miksch Sutton. Indexed. \$15.00.

This is perhaps as sumptuous a bird book as we shall see for a long time to come in this era of high production costs. Although the price is \$15.00, this de luxe volume cost its author about \$25.00 per copy to publish. No commercial publisher could have attempted it.

"Arizona and Its Bird Life" is not a typical "state book," annotated species by species. Its 400,000 words of text are divided into 50 readable chapters which take you with Dr. Brandt through eight seasons of adventure in southeastern Arizona. This arid region is, in the opinion of many ornithologists, the most fascinating biological wonderland in our country. Some of the chapters are outstanding contributions to our knowledge of southwestern birds. For example, the chapter on the wild turkey probably contains more new field data on this grand game bird than has been published in any book since Audubon's "biographies." Several nests such as those of the spotted screech owl, Richmond becard, Mexican chickadee and Apache wren have apparently not been described previously in the literature.

Perhaps Brandt's greatest contribution in this book is his analysis of the ecological distribution of the nesting birds of southeastern Arizona, and the development of what he terms the "life island" concept. By means of a clear schematic

chart he shows the relation of birds to the landscape from the desert streambeds to the high mountain peaks. The 170 breeding birds of the region are broken down into five life zones, six subzones and 24 biological associations.

The 20-bleed-to-the-edge color plates show individual species in typical Arizona scenes. Nine which were painted by Major Allan Brooks are among the last of his works and among his very best. I have been honored to add eight pieces to this gallery, while George Sutton executed a fine study of a pair of Richmond beards building and one of a pair of sulphur-bellied flycatchers fighting. Terrence Shortt contributed an excellent study in thin oils of a family of spotted screech owls. There are also photographs by Maslowski, Ed Harrison, Florence Thornberg and others. It is a most handsome book, fun to read, and calculated to make you want to go to Arizona.

ROGER TORY PETERSON

THE BIRDS ARE YOURS

By Robert S. Lemmon, *The Macmillan Company, New York, 1951. 7 1/4 x 4 3/4 in., 121 pp. Illustrated by Don Eckelberry. \$2.25.*

Many of the activities of birds are complete mysteries to the layman. This sprightly little book answers a number of questions in an informal style. Don Eckelberry's black and white drawings admirably illustrate the text.



John H. Storer's

THE FLIGHT OF BIRDS

A layman's guide to understanding

177 illustrations, 112 pages \$2.50

CRANBROOK INSTITUTE OF SCIENCE
Bloomfield Hills, Michigan

HISTORY OF AMERICAN ORNITHOLOGY BEFORE AUDUBON

Elsa Guerdum Allen

An account of the European background of American Ornithology and of the observations of early explorers and Colonial writers of this Continent, with particular emphasis on Mark Catesby and Alexander Wilson.

Quarto, 205 pp., 55 illus. \$2.00

THE AMERICAN PHILOSOPHICAL SOCIETY
104 South Fifth Street Philadelphia 6, Pa.

RICHARD HEADSTROM

books for all outdoor
enthusiasts

1 BIRDS' NESTS A FIELD GUIDE



Ideal for nature walks summer and winter, covering over 300 birds west to the Rockies. A unique finding key enables the user to identify quickly any nest by its location and structure. 128 pages, illustrated, \$2.75. C. Russell Mason, *Massachusetts Audubon Society*: "Mr. Headstrom's volume should now remove much of the guesswork in identifying nests and lead to increased enjoyment of bird-watchers everywhere as they add this interesting sideline to their hobby."

2 BIRDS' NESTS OF THE WEST A FIELD GUIDE

A companion volume covering 400 birds west of the 100th meridian. 177 pages, illustrated, \$3.00.

3 THE LIVING YEAR

A charming month-by-month account of the world of nature, explaining vividly the habits and homes of insects, birds, and animals. Each chapter has a calendar, a quick summation of what to expect to find in any given month. 256 pages, illustrated with drawings, \$3.00.

Order from any bookseller or directly from the publisher. Return guarantee.*

IVES WASHBURN, INC.

29 West 57th Street, New York 19, New York

Please send me the books whose numbers I've encircled: 1. 2. 3.

I enclose check or money order for \$.....

Name.....

Address.....

City..... Zone..... State.....

* If in any way I am dissatisfied with these books I may return them and my money will be refunded.

When writing advertisers, please mention Audubon Magazine

Bringing the Outdoors Indoors

Audubon Screen Tours



Hugh M. Halliday

Special Introductory Offer

3 personally presented color motion picture programs by the nation's outstanding wildlife lecturers for \$250.

Entertaining as well as educational.

***Write* NATIONAL AUDUBON SOCIETY 1000 Fifth Avenue, New York 28, New York**

MEXICAN BIRDS: FIRST IMPRESSIONS

By George Miksch Sutton, University of Oklahoma Press, Norman, 1951. 10½ x 7 in., 282 pp. Indexed. Illustrated. \$10.00.

This is an informal account of the author's field observations when he went on an ornithological expedition to Tamaulipas, Nuevo Leon, and Coahuila. Illustrated with beautiful color plates and pen and ink drawings. The 70 page appendix, in which brief descriptions of all Mexican birds can be found, will be useful to all birders going to Mexico. A chapter from the book was published in the November-December, 1951 issue of *Audubon Magazine*.

BIRDLIFE OF VIRGINIA

By Joseph J. Shomon, Commission of Game and Inland Fisheries, Richmond, Va., 1951. 9 x 6 in., 88 pp. Paper covers. 25¢.

This booklet could serve as a model for similar publications; it is a handy little field guide to the birds of Virginia, with a complete checklist of all birds occurring in that state and six colored plates illustrating 124 of the most common species. Short chapters on how to study birds and their habits, the economic and recreational value of birds (including photography), the protection of birds, recommended bird activities and attracting birds (including how to make birdhouses), are supplemented by a reference list of useful publications. It is truly admirable to find so much information—illustrated with beautiful photographs—in less than 100 pages and at so small a price.

SEARCH FOR THE SPINY BABBLER: AN ADVENTURE IN NEPAL

By Dillon Ripley, Houghton Mifflin Company, Boston, 1952. 8½ x 6¾ in., 301 pp. Indexed. \$4.00.

For students of birds around the world, Nepal has a special appeal. Its inaccessibility, the great variety of its habitats and the mystery of a land that not a great many Americans and Europeans have visited, make it a legendary paradise. For the first time, government officials gave their full cooperation to a scientific expedition, and Mr. Ripley relates his observations of the country and its people easily and often humorously. As Associate Curator of the Peabody Museum of Natural History at Yale, he is mainly interested in ornithology and his search for rare birds reads like a detective story.

Western Fauna

AMPHIBIANS OF WESTERN NORTH AMERICA

By Robert Stebbins. Gives complete accounts of all the known species and subspecies of salamanders, frogs, and toads. Fully illustrated. Maps and glossary. A splendid book for the professional and amateur naturalist. 540 pages, 35 figures, 64 plates. \$7.50

THE DUSKY-FOOTED WOOD RAT

By Jean M. Linsdale and L. P. Tevis, Jr. An intensive study of the wood rat based on the histories of 580 individuals. Sets forth the life and problems of the animal as revealed in ten years of continuous observation. 664 pages, 132 tables, 384 illustrations. \$7.50

THE CALIFORNIA GROUND SQUIRREL

By Jean M. Linsdale. A comprehensive field study showing the physiology and habits of the ground squirrel, its habitat, distribution, and characteristics. 438 pages, 45 tables, 140 figures and illustrations. \$5.00

MAMMALS OF NEVADA

By E. Raymond Hall. A definitive study, and an important one for every naturalist. 710 pages, 958 figures, 23 illustrations. \$7.50

LIFELONG BOYHOOD

By Loye Miller. A delightful collection of memoirs and non-technical scientific papers of the renowned ornithologist. His writings are marked by the same enthusiasm and lively curiosity as his life. Recommended for bird lovers young and old. 226 pages. \$2.75

UNIVERSITY OF CALIFORNIA PRESS

Address: Berkeley 4, California

When writing advertisers, please mention *Audubon Magazine*

SEE

2 x 2

COLOR SLIDES

36 Slides to Match Volume II of the Bird Song Recordings

Bluebird	Cowbird
Phoebe	Starling
White-breasted Nuthatch	Least Flycatcher
Mourning Dove	Western Meadowlark
House Wren	Dickcissel
White-eyed Vireo	Willet
Tufted Titmouse	Oven-Bird
Blue Jay	Louisiana Water-Thrush
Screech Owl	Black-throated Green Warbler
Red-winged Blackbird	Northern Yellowthroat
Long-billed Marsh Wren	Prothonotary Warbler
Short-billed Marsh Wren	Hooded Warbler
Swamp Sparrow	Chestnut-sided Warbler
American Bittern	Common Loon
Wilson's Snipe	Lesser Canada Goose
Virginia Rail	Pied-billed Grebe
Sora	Coot
	Kingfisher
	Limpkin

These slides may be purchased for \$.50 each or the entire set for \$14.40. Additional slide sets are listed in the "Audubon Audio-Visual Catalog".

Photo and Film Dept. R
NATIONAL AUDUBON SOCIETY
1000 5th Avenue, New York 28, N. Y.

Please send me copies of the "Audubon Audio-Visual Catalog." I am enclosing 10c per copy to help cover mailing costs.

NAME

ADDRESS

THE BIRDS OF THE MALAY PENIN- SULA, SINGAPORE AND PENANG

By A. G. Glenister, Oxford University Press,
New York, 1952. 8¾ x 5¾ in., 282 pp. In-
dexed. \$6.00.

This is a field guide which will be valued not only by those visiting the Malay Peninsula, Thailand or the Dutch East Indies, but by American ornithologists interested in exotic birds. Many color plates and drawings by the author's wife illustrate the text which gives detailed descriptions as well as habitats.

WILDLIFE IN COLOR

By Roger Tory Peterson, Houghton Mifflin Company, Boston, 1951. 7¾ x 5½ in., 191 pp. Indexed. \$3.00.

For many years, the National Wildlife Federation has published a distributed series of poster stamps. Four hundred and fifty of these miniature portraits of birds, mammals, fish, flowers and trees by leading wildlife artists have been grouped by habitats in this little book. Mr. Peterson's text is a commentary on wildlife communities, emphasizing the importance of conservation. This attractive book will introduce many readers to ecology for the first time and will give them a better conception of how nature functions.

TREES FOR AMERICAN GARDENS

By Donald Wyman, The Macmillan Company, New York, 1951. 9½ x 6¼ in., 376 pp. Indexed. \$7.50.

A companion volume to "Shrubs and Vines for American Gardens," this book will be useful to the layman and the professional landscapist. Information is given about favorable regions, hardiness, the order of bloom, foliage color, ornamental fruits, and susceptibility to pests. Special sections will be found on trees for various purposes, i.e., shady locations, different soils, height, etc. A list of 745 species of recommended trees is given in alphabetical order. Maps, line drawings and photographs illustrate the text.

THE MOLDS AND MAN: AN INTRO- DUCTION TO THE FUNGI

By Clyde M. Christensen, University of Minnesota Press, Minneapolis, 1951. 9 x 5¾ in., 244 pp. Indexed. \$4.00.

The author, professor of plant pathology at the University of Minnesota, relates in this book

the basic facts about fungi, how they live and reproduce, how they affect other plants and animals, and how they are useful to man. Lively humor, rarely found in the treatment of scientific subjects, makes this book both entertaining and informative reading.

THE SHELL BOOK: A POPULAR GUIDE TO A KNOWLEDGE OF THE FAMILIES OF LIVING MOLLUSKS AND AN AID TO THE IDENTIFICATION OF SHELLS NATIVE AND FOREIGN

By Julia Ellen Rogers, Charles T. Branford, Boston, 1951. 10¼ x 7 in., 503 pp. Illustrated. Indexed. \$6.95.

This is a new edition of the popular manual. The list of names has been brought up to date by Dr. Harold A. Rehder, Curator of Mollusks at the Smithsonian Institution. Illustrated with photographs and colored plates, the text gives short descriptions and distribution as well as some data on the habits of shell-bearing animals native and foreign.

INSECT CONTROL BY CHEMICALS

By A. W. A. Brown, John Wiley & Sons, Inc., New York, 1951. 7¾ x 5¾ in., 817 pp. Indexed. \$12.50.

This book presents the essential facts and theories on the chemical, physical and toxicological properties of insecticides. It will be valuable to entomologists and to all those interested in pest control and its effect on wildlife. Extensive bibliographies at the end of each chapter list other useful references.

AMERICAN SOCIAL INSECTS: A BOOK ABOUT BEES, ANTS, WASPS AND TERMITES

By Charles D. and Mary H. Michener, D. Van Nostrand Company, Inc., New York, 1951. 8¾ x 5¾ in., 267 pp. Indexed. \$6.00.

The organization of insect communities is fascinating to most of us and raises questions about

**L. H. Walkinshaw's
THE SANDHILL CRANES
A full life history report**

202 pages, richly illustrated \$3.50
CRANBROOK INSTITUTE OF SCIENCE
Bloomfield Hills, Michigan

The timeless story
of a thrilling and
mysterious phenomenon,
the great annual migration
of ducks,
told with lyrical
beauty by the author
of *City of the Bees*



**FRANK S.
STUART'S**

Wild Wings

At all bookstores \$3.50

McGRAW-HILL BOOK CO., Inc.

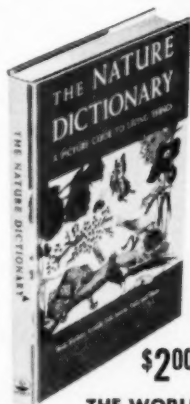
330 WEST 42nd STREET, N. Y. 36

A big new clothbound guide
to the whole world of nature
EVERY PAGE IN FULL COLOR!

The Nature Dictionary

by **JOHN H. MELADY**

Illustrated by
SAMUEL NISENSEN



Wonderful book for both children and adults, with thousands of absorbing facts about birds, animals, fish, insects, flowers, trees, and butterflies—each definition accompanied by a large illustration in full color—500 in all. Index, glossary. 8¾ x 11".

\$2.00

At all bookstores,
or from

THE WORLD PUBLISHING COMPANY

2231 West 110th Street, Cleveland 2, Ohio

When writing advertisers, please mention Audubon Magazine

the mystery of instinct versus reasoned intelligence, about means of communication between insects, insect biology and psychology. Fabre and Maeterlinck, famed for their researches in entomology, devoted years to the recording of their observations of social insects and their behavior. A bibliography of scientific works on the subject would occupy more than a volume, but the present book, another in the New Illustrated Naturalist series, skillfully blends the latest scientific findings in an absorbing narrative which is not only pleasant reading, but rewarding for the serious student of insects. The author is Chairman of the Department of Entomology at the University of Kansas. Superb

photographs, many of which are in color, illustrate the text.

FABULOUS BEASTS

By Peter Lum, Pantheon Books, Inc., New York, 1951. 8¾ x 5¾ in., 256 pp. Illustrated by Anne Marie Jaus. Indexed. \$3.75.

The creation of imaginary animals is founded equally on the real and the unreal. It is to the credit of the author to have interwoven fact and fancy, art and literature in a little book where those interested in mythology will find "data" on the phoenix and the unicorn, dragon, gryphon, and many other fanciful creatures.

CLASSIFIED

Rates for classified advertising: 15¢ a word; minimum order \$3.00.

WE ARE BINOCULAR SPECIALISTS. See our recent "Know Your Binoculars" articles in Audubon Magazine—how to use, choose and check a binocular. Reprint now available—10¢. Also send for our free list of new and reconditioned binoculars. Includes all American, German and Japanese binoculars that pass our exacting laboratory tests, some as low as \$20. We ship on 20 days' trial. Liberal trade-in on old glasses. We also repair and coat all makes of binoculars; if yours is not in good condition, send it to us for free estimate. We've been serving birders since 1923; let us solve your binocular problem. Closed Saturdays except by appointment. **The Reicherts, Mirakel Repair Co., 14 West First St., Mount Vernon 2, N. Y.**

BOOKS on Birds, Mammals, Natural History subjects. New or out-of-print. Catalogs furnished. **Pierce's, Winthrop, Iowa.**

BOOKFINDER. World-wide search. Any book. Any subject. Send wants. Falconry specialist. **R. Hecht, 3965a Shenandoah, St. Louis 10, Missouri.**

NATURAL SCIENCE 2x2 full color identified slides. Insects, minerals, geology, wildflowers, trees, clouds, wildlife. Lists free. Purchasers receive informative literature. **Scott Lewis, 2500 North Beechwood, Hollywood 28, Calif.**

BIRD PHOTOGRAPHS. Sixteen exclusive 2x2 projection slides in glorious direct color, \$5.00. Three for \$1.00. **J. M. Stemen, Goshen, Indiana.**

MOVIE FOOTAGE WANTED, original, 16 mm. Kodachrome of birds and other wildlife by amateur photographer. **A. M. Dewey, 3 E. 336th Street, Willoughby, Ohio.**

SECURE YOUR OUT-OF-PRINT new and old books from the AUDUBON BOOK SERVICE, 415 Lincoln Avenue, Brooklyn 8, N. Y.

SAVE! FREE 20-page, 3 color binocular catalog. 60 different models. **United Binoculars, A-1428, 9943 S. Western, Chicago 28.**

BINOCULARS. Eventually you want the finest. Always available New. Intest Hensoldt, Zeiss, Marburg-Lahn, \$75 up. "Langguth's," 1901 Taggart, Boise, Idaho.

BINOCULAR SPECIALISTS, all makes repaired. Free estimates, prompt service, work guaranteed. Authorized Zeiss, Hensoldt dealer. **Tele-Optics, 5514 Lawrence, Chicago 30, Illinois.**

BINOCULARS. Service and repair on all makes. Prompt service and return. Also authorized dealers for Bausch & Lomb and we sell many other makes of binoculars, field glasses and telescopes. Established 1921. **Charles W. Mayher & Son, 5 South Wabash Avenue, Chicago 3, Illinois.**

BENT'S LIFE HISTORIES (179) Flycatchers, larks, swallows. Some copies available, \$4.75 each. Request natural history book catalogue. **Killian's, 1043 Carroll Street, Brooklyn 25, New York.**

CAMP COUNSELOR for extensive nature program in boys' camp in the Berkshires, next to Tanglewood, Lenox, Mass. Knowledge, enthusiasm, and flair for working with boys. Also Pioneer Counselor for trip camping. Salary commensurate with experience, ability. Write fully to **Joseph Kruger, director, 375 Osborne Terrace, Newark 8, N. J.**

NORTH COUNTRY FARM. Perfect place to rest, write, watch northern thrushes, warblers and nesting grosbeaks. Wonderful wildflower weeks May 16 to 30. Fine accommodations, nature library, records. \$6 a day. **Colebrook, New Hampshire.**

SUMMER RENTAL, month or season. Convenient, comfortable, furnished cottage, four acres woodland, 600-foot shoreline on Lake Champlain. Privacy. Adirondack view. Birding, fishing, swimming. Skiff. References exchanged. Apply to: **Miss Katharine Thorp, R. D. No. 4, Ithaca New York.**

FOR SALE. Borden Camera Gun for use with Filmo Camera. Never used. Retail value \$145. Will sell for \$100. **Howard Cleaves, 8 Maretzek Court, Staten Island 9, New York.**

FOR NESTING SEASON and Autumn Holidays. Completely equipped camp, Squam Lake, New Hampshire. Privacy, charm, comfort. **E. S. Chalmers, 6130 Ardleigh Street, Philadelphia 38, Penna.**

FORBUSH, E. H. "Birds of Massachusetts and Other New England States"—3 volumes, 1925, 1927, 1929, first edition of each volume. Also "Game Birds, Wildfowl and Shore Birds" 1912—first edition. \$40 for the 4 volumes. **Prescott Fay, Framingham, Massachusetts.**

When writing advertisers, please mention Audubon Magazine

Proposed Bird Migration Study

We have received a notice from a member of the Wisconsin Society for Ornithology of a proposed cooperative study of bird migration from east Texas, north to central Minnesota, and from Georgia to Ontario, Canada. If your local bird group is within this geographical region and might be interested in cooperating in this project, please write to James H. Zimmerman, 2114 Van Hise Avenue, Madison, Wisconsin, for details.—*The Editors.*

CHARLES KENDEIGH

Leading Ecologist

Says



I would like to say a few words concerning the contribution made by Audubon Field Notes to science. I believe the contribution made by Audubon Field Notes is especially important in the field of ecology.

The breeding bird and wintering bird censuses are becoming of increasing interest and importance as a larger number of ornithologists participate and include a greater variety of natural habitats in all parts of the country.

All persons interested in observations of birds out-of-doors and in understanding their behavior and distribution should certainly subscribe to this periodical. Not only that, they should also participate in the studies going on. They are very much worth while.

Very truly yours,
S. CHARLES KENDEIGH

Audubon Field Notes

\$2 A YEAR (six issues)

1000 Fifth Avenue, New York 28, N. Y.

REPRINTS from Audubon Magazine

Only 10c



SPRING IS HERE!

Audubon Magazine reprints are timely aids for everyone interested in birds and gardens. You'll know your birds better, and see them more often, if you will follow the expert instructions in these leaflets.

More Birds for Your Garden

by John K. Terres 10 cents

Discusses the trees and shrubs that are attractive to birds and the value of birdbaths.

Flower Gardens for Birds

by Robert S. Lemmon 10 cents

Advice on growing 47 kinds of garden flowers that are especially attractive to birds.

Care and Feeding of Wild Birds

by John K. Terres 10 cents

Gives rules for becoming a successful foster-parent to orphaned birds and how to attract birds by providing nesting material.

What Field Glasses for Birds?

by George Dock, Jr. 10 cents

Some answers to the baffling question of what kind of binoculars you should choose to see birds.

Know Your Binoculars

by Robert J. and Elsa Reichert 10 cents

Invaluable information about care, handling and "getting the most" out of your binoculars.

Write to REPRINTS

NATIONAL AUDUBON SOCIETY

1000 Fifth Avenue, New York 28, New York

SEE THE
Everglades
IN
April

Right now this vast acreage in south Florida is alive with Snowy, Reddish and American Egrets, White Ibises, Great White Herons, Roseate Spoonbills, hordes of waterfowl and many other thrilling species. Explore this strange wilderness by station wagon and boat on an

AUDUBON WILDLIFE TOUR

For Reservation and Illustrated Folders
write to

NATIONAL AUDUBON SOCIETY
13 McAllister Arcade, Miami 32, Florida

SPECIAL REPRINT OFFER

We have AUDUBON MAGAZINE reprints available of three outstanding articles about conservation. Because we know the importance of distributing these reprints widely, we are offering them at 5 cents each, for orders of 50 or more, instead of the regular price of 10 cents each. The reprints are:

Persecution or Freedom?

by Irston Barnes
(September-October 1951)

The Story of Island Beach

by John K. Terres
(January-February 1952)

**The Key Deer: A Challenge
From the Past**

by Robert P. Allen
(March-April 1952)

ORDER FROM:

REPRINTS
National Audubon Society
1000 Fifth Avenue
New York 28, New York

AMERICAN BITTERN—Continued from Page 117

homes by bending the flags leading out on either side. The hen bird creeps toward the spot on one path but leaves it by the other, always after careful reconnaissance and considerable deliberation. She lays from three to seven eggs, but four or five is the usual number. They are somewhat glossy, vary from buffy brown to olive, are elliptical ovate, and hatch in about 28 days.

The buffy young lack the darker markings of mature birds but look equally snake-like, hissing like adders and striking viciously at one's fingers. The female feeds them by regurgitation, each youngster in turn seizing the beak of the mother and holding fast until it has gulped down a salamander, slug, or perhaps a small horned pout. After feeding they flop on their sides as if exhausted and lie still for a quarter of an hour or longer. Then hunger stirs them up again and they crowd along the side of the nest waiting impatiently for their mother's return with more food.

The brown of the male bittern's upper plumage is subject to one remarkable variation in the nesting season. On the back and shoulders a pair of ruffs, nearly white and shaped like wings, may appear. Ordinarily invisible beneath the wing coverts, these light plumes are obtruded for display, either during courtship or when the bittern tilts with a rival male. In combat, the spear-like beak is a formidable weapon which the Narragansett Indians used for arrowheads.

The American bittern is a piece of stubborn antiquity, perfectly fitted for life in the green world where it wisely desires nothing but to be left alone, and where it will probably survive until the last bog is drained.

ANSWERS TO PHOTO QUIZ

1. Avocet.
2. Audubon's caracara.
3. Northern flicker. The males of the closely related red-shafted flicker of the West have red facial markings and salmon-red wing and tail linings, instead of the yellow linings of the flicker.

DO YOU RECEIVE ALL THREE?

The National Audubon Society publishes three magazines which have strong appeal to those interested in the out-of-doors. One of these, *Audubon Magazine*, is sent free to all members. The other two may be subscribed to separately at modest rates.



OUTDOORS ILLUSTRATED is noted for its lively articles in every field of nature. Beautifully illustrated, including many color plates, it provides both entertainment and instruction. Especially adapted to school use but interesting to everyone.

(5 issues)
\$2.00 a year

AUDUBON FIELD NOTES reports the distribution, migration, and abundance of birds. It is a requisite for active bird watchers because its seasonal reports offer the only way to keep informed about what birds are being seen where in your region. It contains the annual Christmas Count and Breeding Bird Census.

(bimonthly)
\$2.00 a year



AUDUBON MAGAZINE has won wide acclaim for its strong editorial policy on conservation and for its superb photographs and fascinating articles by America's leading nature writers. Sections on attracting birds, and nature books are regular features.

Membership—\$5.00 a year
Subscription—\$3.00 a year

address your own or gift subscriptions to:

NATIONAL AUDUBON SOCIETY
1000 FIFTH AVENUE—NEW YORK 28, NEW YORK

